TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
0079	11/122,154	05/04/2005	Pressure Pulse / Shock Wave Therapy Methods and an Apparatus for Conducting the Therapeutic Methods

Publication Date: May 11, 2006 Grant Date: Dec 30, 2008	Publication No. US 2006/0100550 A1; Patent No: 7,470,240 Status: Maint Fee: all paid

Continuity: Continuation in part of	11/071,156	03-04-2005	Abandoned
Claims Priority from Provisional Application	60/642,149	01-10-2005	Expired
Claims Priority from Provisional Application	60/621,028	10-22-2004	Expired

The method of stimulating a substance is disclosed. The method has the steps of activating an acoustic shock wave generator or source to emit acoustic shock waves; and subjecting the substance to the acoustic shock waves stimulating said substance wherein the substance is positioned within a path of the emitted shock waves and away from a geometric focal volume or point of the emitted shock waves. In one embodiment the emitted shock waves are divergent or near planar. In another embodiment the emitted shock waves are convergent having a geometric focal volume of point at a distance of at least X from the source, the method further comprising positioning the substance at a distance less than the distance X from the source. The substance is a tissue having cells. The tissue can be an organ of a mammal. The mammal may be a human or an animal. The organ may be a heart, a brain, skin, a liver or a kidney or any other organ. The tissue may be muscle, cartilage, tendon, bone, teeth or gums. The tissue may be a part of the vascular system, a part of the nervous system, a part of the urinary or reproductive system, a part of the lymph node or pituitary systems, a part of the ocular system or a part of a skeletal system.

1. The method of stimulating a cellular substance comprises the steps of:

treating the cellular substance;

activating an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves directed toward the substance to impinge the substance with pressure pulses or shock waves having a low energy density in the range of 0.0001 mJ/mm<2 > to 1.0 mJ/mm<2> ; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds ([mu]s) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and

subjecting the cellular substance to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the substance wherein the cellular substance is positioned within a path of the emitted shock waves or pressure pulses and away from any

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cellular substance or beyond the cellular substance thereby passing the emitted waves through the cellular substance while avoiding having any localized focal point within the cellular substance wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 > to a high end of below 1.0 mJ/mm<2> .

2. The method of stimulating a substance of claim 1 wherein the substance is a tissue having cells.

3. The method of stimulating a substance of claim 2 wherein the tissue is an organ of a mammal.

4. The method of stimulating a substance of claim 2 wherein the tissue is muscle.

5. The method of stimulating a substance of claim 2 wherein the tissue is cartilage

6. The method of stimulating a substance of claim 2 wherein the tissue is tendon.

7. The method of stimulating a substance of claim 2 wherein the tissue is bone.

8. The method of stimulating a substance of claim 7 wherein the bone has a non-union which is subjected to the acoustic shock waves to stimulate healing.

9. The method of stimulating a substance of claim 7 wherein the bone has an indication of bone cancer.

10. The method of stimulating a substance of claim 2 wherein the tissue is teeth.

11. The method of stimulating a substance of claim 2 wherein the tissue is gums.

12. The method of stimulating a substance of claim 2 wherein the tissue is a part of the vascular system.

13. The method of stimulating a substance of claim 2 wherein the tissue is a part of the nervous system.

14. The method of stimulating a substance of claim 13 wherein the nerves are damaged and the step of subjecting the tissue including said nerves to shock waves include to stimulate healing or stimulate finding of severed or otherwise damaged nerve

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

ends.

15. The method of stimulating a substance of claim 13 wherein the patient has an indication of paraplegia.

16. The method of stimulating a substance of claim 2 wherein the tissue is a part of the urinary or reproductive system.

17. The method of stimulating a substance of claim 2 wherein the tissue is a part of the lymph node or pituitary systems.

18. The method of stimulating a substance of claim 2 wherein the tissue is a part of the ocular system.

19. The method of stimulating a substance of claim 2 wherein the tissue is a part of a skeletal system.

20. The method of stimulating a substance of claim 2 wherein the step of subjecting the substance to acoustic shock waves stimulates at least some of said cells within said substance to release or produce one or more of nitric oxygen (NO), vessel endothelial growth factor (VEGF), bone morphogenetic protein (BMP) or other growth factors.

21. The method of stimulating a substance of claim 2 wherein the substance tissue has a pathological condition.

22. The method of stimulating a substance of claim 2 wherein the substance tissues have been subjected to a prior trauma.

23. The method of stimulating a substance of claim 2 wherein the substance tissue has been subjected to an operative procedure.

24. The method of stimulating a substance of claim 2 wherein the substance tissue is in a degenerative condition.

25. The method of stimulating a substance of claim 1 wherein the substance is a tissue in a degenerative condition.

26. The method of stimulating a substance of claim 2 wherein the tissue has an indication of diabetes.

27. The method of stimulating a substance of claim 2 wherein the tissue has an indication of cystic fibrosis.

28. The method of stimulating a cellular substance comprises the steps of:
treating the cellular substance;
activating an acoustic shock wave generator or source to emit acoustic shock waves directed toward the substance to impinge the substance with shock waves having a low energy density in the range of 0.0001 mJ/mm<2 > to 1.0 mJ/mm<2 > ; the pressure

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds ([mu]s) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and

subjecting the cellular substance to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of cellular damage evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the substance wherein the cellular substance is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cellular substance or beyond the cellular substance thereby passing the emitted waves through the cellular substance while avoiding having any localized focal point within the cellular substance wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 > to a high end of below 1.0 mJ/mm<2 > wherein the cellular substance is a tissue having cells and the pressure pulses or shock waves stimulate a cellular response in the tissue in the absence of cellular damage in the tissue evidenced by the avoidance of localized hemorrhaging.

29. The method of stimulating a substance of claim 28 wherein the tissue is an organ of a mammal.

30. The method of stimulating a substance of claim 28 wherein the tissue is muscle.

31. The method of stimulating a substance of claim 28 wherein the tissue is cartilage.

32. The method of stimulating a substance of claim 28 wherein the tissue is tendon.

33. The method of stimulating a substance of claim 28 wherein the tissue is bone.

34. The method of stimulating a substance of claim 33 wherein the bone has a non-union which is subjected to the acoustic shock waves to stimulate healing.

35. The method of stimulating a substance of claim 33 wherein the bone has an indication of bone cancer.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

36. The method of stimulating a substance of claim 28 wherein the tissue is teeth.

37. The method of stimulating a substance of claim 28 wherein the tissue is gums.

38. The method of stimulating a substance of claim 28 wherein the tissue is a part of the vascular system.

39. The method of stimulating a substance of claim 28 wherein the tissue is a part of the nervous system.

40. The method of stimulating a substance of claim 39 wherein the nerves are damaged and the step of subjecting the tissue including said nerves to shock waves include to stimulate healing or stimulate finding of severed or otherwise damaged nerve ends.

41. The method of stimulating a substance of claim 39 wherein the patient has an indication of paraplegia.

42. The method of stimulating a substance of claim 28 wherein the tissue is a part of the urinary or reproductive system.

43. The method of stimulating a substance of claim 28 wherein the tissue is a part of the lymph node or pituitary systems.

44. The method of stimulating a substance of claim 28 wherein the tissue is a part of the ocular system.

45. The method of stimulating a substance of claim 28 wherein the tissue is a part of a skeletal system.

46. The method of stimulating a substance of claim 28 wherein the step of subjecting the substance to acoustic shock waves stimulates at least some of said cells within said substance to release or produce one or more of nitric oxygen (NO), vessel endothelial growth factor (VEGF), bone morphogenetic protein (BMP) or other growth factors.

47. The method of stimulating a substance of claim 28 wherein the substance tissue has a pathological condition.

48. The method of stimulating a substance of claim 28 wherein the substance tissues have been subjected to a prior trauma.

49. The method of stimulating a substance of claim 28 wherein the substance tissue has been subjected to an operative procedure.

50. The method of stimulating a substance of claim 28 wherein the substance tissue is in a degenerative condition.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

51. The method of stimulating a substance of claim 28 wherein the substance is a tissue in a degenerative condition.

52. The method of stimulating a substance of claim 28 wherein the tissue has an indication of diabetes.

53. The method of stimulating a substance of claim 28 wherein the tissue has an indication of cystic fibrosis.

Divisionals:

DN0079 DIV1 12/246,560 filed 10/07/2008 Pub No. 2009/0254007A1 Patent No. 7,841,995
Status: Granted 11/30/10 Maint Fee: all paid

1. The method of stimulating a cellular substance wherein the cellular substance is a tissue having cells and the tissue is either part of an organ or the entire organ of a human or animal comprises the steps of:
treating the cellular substance;
activating an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves directed toward the substance to impinge the substance with pressure pulses or shock waves having a low energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and
subjecting the cellular substance to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the substance wherein the cellular substance is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cellular substance or beyond the cellular substance thereby passing the emitted waves through the cellular substance while avoiding having any localized focal point within the cellular substance wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>.

2. The method of stimulating a substance of claim 1 wherein the emitted shock waves are divergent or near

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

planar, or wherein the emitted shock waves are convergent having a geometric focal volume or point at a distance of at least X from the generator or source, the method further comprising positioning the substance at a distance less than the distance X from the source.

3. The method of stimulating a substance of claim 1 wherein the organ is either a heart, a brain, skin, a live or a kidney.

4. The method of stimulating a substance of claim 3 wherein the step of subjecting the substance to acoustic shock waves includes the step of treating cirrhosis of the liver.

5. The method of stimulating a substance of claim 3 wherein the substance has an indication of myelodysplasia.

6. The method of stimulating a substance of claim 1 wherein the step of subjecting the substance to acoustic shock waves includes the step of correcting a pathological growth of the epiphysial plate.

7. The method of stimulating a substance of claim 1 wherein the step of subjecting the substance to acoustic shock waves includes killing bacteria by destroying bacterial cell membranes or stimulating a biological defense mechanism within said substance by exposure to the acoustic shock waves.

8. The method of stimulating a substance of claim 1 wherein the substance includes one or more vertebrae.

9. The method of stimulating a substance of claim 1 wherein the substance is the stomach and wherein the stomach has one or more stomach ulcers.

10. The method of stimulating a substance of claim 1 wherein the substance further includes a joint and surrounding tissue.

11. The method of stimulating a substance of claim 10 wherein the substance has an indication of arthritis.

12. The method of stimulating a substance of claim 10 wherein the substance has an indication of gout.

13. The method of stimulating a substance of claim 1 wherein the substance has an indication of rheumatic disease and wherein the rheumatic disease is Lupus.

14. The method of stimulating a substance of claim 1 wherein the step of subjecting the substance to acoustic shock waves includes the step of treating osteoporosis.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

15. The method of stimulating a substance of claim 1 wherein the step of subjecting the substance to acoustic shock waves includes the step of treating pseudoarthrosis.

16. The method of stimulating a substance of claim 1 wherein the step of subjecting the substance to acoustic shock waves includes the step of treating HIV.

17. The method of stimulating a substance of claim 1 wherein the step of subjecting the substance to acoustic shock waves includes the step of treating periodontal diseases.

18. The method of stimulating a substance of claim 1 wherein the step of subjecting the substance to acoustic shock waves includes the step of treating emphysema.

19. The method of stimulating a cellular substance wherein the cellular substance is a placenta having stem cells, or a patient having stem cells or a culture of stem cells comprises the steps of:
treating the cellular substance;
activating an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves directed toward the substance to impinge the substance with pressure pulses or shock waves having a low energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and
subjecting the cellular substance to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the substance wherein the cellular substance is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cellular substance or beyond the cellular substance thereby passing the emitted waves through the cellular substance while avoiding having any localized focal point within the cellular substance wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>.

20. The method of stimulating a substance of claim 19 wherein the shock waves stimulate the stem cells enhancing replication.

DN0079 DIV2 12/246,583 filed 10/07/2008 Pub No. 2009/0036803A1 Patent No. 7,905,845
Status: Granted 03/15/2011 Maint Fee: all paid

1. The method of stimulating a cellular substance wherein the cellular substance is a tissue having cells and the tissue is either part of an organ or the entire organ of a mammal comprises the steps of:
treating the cellular substance;
activating an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves directed toward the substance to impinge the substance with pressure pulses or shock waves having a low energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and
subjecting the cellular substance to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the substance wherein the cellular substance is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cellular substance or beyond the cellular substance thereby passing the emitted waves through the cellular substance while avoiding having any localized focal point within the cellular substance wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>.

2. The method of stimulating a substance of claim 1 wherein the emitted shock waves are divergent or near planar.

3. The method of stimulating a substance of claim 1 wherein the emitted shock waves are convergent having a geometric focal volume or point at a distance of at least X from the generator or source, the method further comprising positioning the substance at a distance less than the distance X from the source.

4. The method of stimulating a substance of claim 1 wherein the mammal is a human or an animal.

5. The method of stimulating a substance of claim 1 wherein the substance is skin exhibiting one or more skin sarcomas.

6. The method of stimulating a substance of claim 1 wherein the substance is subcutaneous tissue.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

7. The method of stimulating a substance of claim 1 wherein the substance exhibits cellulitis or other subcutaneous infections.

8. The method of stimulating a substance of claim 1 wherein the step of subjecting the substance to acoustic shock waves includes the step of treating wounds.

9. The method of stimulating a substance of claim 8 wherein the wound is a burn.

10. The method of stimulating a substance of claim 1 wherein the step of subjecting the substance to acoustic shock waves includes the step of treating ulcers.

11. The method of stimulating a substance wherein the substance is a tissue having cells and the tissue is either a part or all of the skin or the subcutaneous tissue underlying the skin, or the combination of the skin and subcutaneous tissue of a mammal comprises the steps of:
treating the cellular substance;
activating an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves directed toward the substance to impinge the substance with pressure pulses or shock waves having a low energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and
subjecting the cellular substance to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the substance wherein the cellular substance is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cellular substance or beyond the cellular substance thereby passing the emitted waves through the cellular substance while avoiding having any localized focal point within the cellular substance wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>.

12. The method of stimulating a substance of claim 11 wherein the substance is skin and subcutaneous tissue.

13. The method of stimulating a substance of claim 12 wherein the skin and subcutaneous tissue exhibit cellulitis.

14. The method of stimulating a substance of claim 11 wherein the substance includes a wound or scar tissue.

15. The method of stimulating a substance of claim 11 wherein the substance includes acne.

16. The method of stimulating a substance of claim 11 wherein the substance is skin exhibiting surface irregularities and wherein the exposure to the acoustic shock waves stimulates a skin smoothing reaction.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

17. The method of stimulating a substance of claim 11 wherein the substance is skin and subcutaneous tissue having hair follicles, wherein the exposure to the acoustic shock waves stimulates hair growth.

DN0079 DIV3 12/246,599 filed 10/07/2008 Pub No. 2009/0030352A1 Patent No. 7,883,482
Status: Granted 02/08/2011 Maint Fee: all paid

1. A method of reducing or eliminating a mass within a cellular substance wherein the cellular substance is a tissue having cells and the tissue is either part of an organ or the entire organ of a human or animal comprises the steps of:
detecting the presence of said mass in said substance;
localizing said mass generally within said substance;
treating the cellular substance;
activating an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves directed toward the substance to impinge the substance with pressure pulses or shock waves having a low energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle;
subjecting the cellular substance to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the substance wherein the cellular substance is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cellular substance or beyond the cellular substance thereby passing the emitted waves through the cellular substance while avoiding having any localized focal point within the cellular substance wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>; and stimulating said substance by subjecting low energy divergent, planar or near planar acoustical waves or convergent focused acoustical waves wherein a geometric focal point or volume of the focused waves is not focused at the mass at least for a predetermined time during the step of stimulating the substance.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

2. The method of reducing or eliminating a mass within a substance of claim 1 further comprises the step of focusing the geometric focal volume or point of convergent high energy acoustical waves on the mass after the substance has been previously stimulated by the low energy acoustical waves.

3. The method of reducing or eliminating a mass within a substance of claim 2 wherein the step of focusing convergent high energy acoustical waves on the mass generates cellular trauma within said mass.

4. The method of reducing or eliminating a mass within a substance of claim 3 wherein said cellular trauma essentially ruptures cells within said mass thereby reducing or eliminating said mass.

5. The method of reducing or eliminating a mass within a substance of claim 1 wherein the step of stimulating said substance activates at least some of said cells in proximity to said mass, said cells being enriched with mass destroying agents.

6. The method of reducing or eliminating a mass within a substance of claim 1 wherein said mass destroying agents include one or more drugs, chemicals or genetic therapeutic agents.

7. The method of reducing or eliminating a mass within a substance of claim 1 further comprises the step of: surgically removing at least a portion of the mass.

8. The method of reducing or eliminating a mass within a substance of claim 1 further comprises the step of: administering one or more drugs to be delivered to the substance or the mass within said substance.

9. The method of reducing or eliminating a mass within a substance of claim 1 further comprises the step of: irradiating said mass.

10. The method of reducing or eliminating a mass within a substance of claim 1 wherein the organ is a brain, heart, kidney, liver, skin or other soft tissued organ.

11. The method of reducing or eliminating a mass within a substance of claim 1 wherein the substance is a portion of a skeletal system, a tooth or a gum or other hard tissued substance.

12. The method of claim 1 wherein the mass is a tumor.

13. The method of stimulating a substance of claim 1 wherein the step of stimulating includes stimulating wealthy or otherwise enriched cells to fight tumor cells within the tissue.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

14. The method of stimulating a substance of claim 1 further comprises a step of administering one or more antibiotics or other drugs to a blood stream within the substance, a blood stream being stimulated by the acoustic shock waves.

15. The method of preventive shock wave therapy comprises the steps of:
identifying an at risk patient, the patient having an at risk tissue;
treating the cellular substance;
activating an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves directed toward the substance to impinge the substance with pressure pulses or shock waves having a low energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle;
subjecting the cellular substance to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the substance wherein the cellular substance is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cellular substance or beyond the cellular substance thereby passing the emitted waves through the cellular substance while avoiding having any localized focal point within the cellular substance wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>; and subjecting the at risk tissue to shock waves to stimulate tissue repair.

16. The method of preventive shock wave therapy of claim 15 wherein the step of stimulating includes stimulating wealthy or otherwise enriched cells to fight tumor cells within the tissue.

17. The method of preventive shock wave therapy of claim 15 wherein the step of identifying an at risk patient includes one or more indications of risk based on family history, genetic disposition, physical condition, or blood or tissue analysis.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

18. The method of preventive shock wave therapy of claim 15 further comprises the step of testing the at risk tissue to establish measured baseline condition pre shock wave therapy.

19. The method of preventive shock wave therapy of claim 18 further comprises the step of post shockwave therapy testing the treated at risk tissue for comparison to the baseline condition.

0090	11/238,731	09/29/2005	Pressure Pulse/Shock Wave Therapy Methods for Organs
Publication Date: Feb 16, 2006 Grant Date: 03/24/2009		Publication No. US 2006/0036195 A1 Patent No. 7,507,213 Status: Maint Fee: all paid	

The method of stimulating an organ comprises the steps of providing an at least partially exposed or direct access portal to an organ, activating an acoustic shock wave generator or source to emit acoustic shock waves; and subjecting the organ to the acoustic shock waves stimulating said organ wherein the organ is positioned within a non obstructed path of the emitted shock waves.

0091	11/238,524	09/29/2005	A Treatment or Pre-Treatment for Radiation / Chemical Exposure
Publication Date: Oct 11, 2007 Grant Date: 05/26/2009		Publication No. US 2007/0239072 A1 Patent No. 7,537,572 Status: Maint Fee: all paid	

A method of treatment for a tissue organ or entire body of a patient prior to or after exposure to chemicals or radiation or both comprises the steps of activating an acoustic shock wave generator or source to emit acoustic shock waves; and subjecting the tissue, organ or entire body to the acoustic shock waves stimulating said tissue, organ or body wherein the tissue, organ or body is positioned within a path of the emitted shock waves.

1. An invasive method of stimulating an organ having tissue made of cellular matter comprises the steps of:
exposing an organ by an invasive or open surgical procedure to provide an at least partial exposed organ or an access portal to an organ:
activating an acoustic pressure pulse shock wave generator or source to emit a pressure pulse or acoustic shock waves from a shock wave head, the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure,

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and wherein the shock wave head is directed to enter either the access portal or an opening wherein the organ is at least partially exposed to permit entry of the shock wave head directly to the organ; and

subjecting the organ to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the organ stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of hemorrhaging caused by the emitted waves or pulses in the tissue of said organ wherein the organ is positioned within an unobstructed path of the emitted shock waves or pressure pulses without interfering tissue or skeletal bone mass; and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the tissue or beyond the tissue thereby passing the emitted waves or pulses through the tissue while avoiding having any localized focal point within the tissue of the organ wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>; and wherein the organ is a heart, a liver or a kidney or a portion of a brain or any other organ or portion thereof; and wherein the shock wave head is internally directed in contact or near contact with the exposed organ directly or through a coupling gel or oil or coupling medium.

2. The invasive method of stimulating an organ of claim 1 wherein the emitted pressure pulses or shock waves are convergent having one or more geometric focal volumes or points at a distance of at least X from the generator or source, the method further comprising positioning the organ at a distance at or less than the distance X from the source.

3. The invasive method of stimulating an organ of claim 1 wherein the organ is a heart.

4. The invasive method of stimulating an organ of claim 1 wherein the organ is a brain.

5. The invasive method of stimulating an organ of claim 1 wherein the organ is a liver.

6. The invasive method of stimulating an organ of claim 1 wherein the organ is a kidney.

7. The invasive method of stimulating an organ of claim 1 wherein the organ is a part of the vascular system.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

8. The invasive method of stimulating an organ of claim 1 wherein the organ is a part of the nervous system.

9. The invasive method of stimulating an organ of claim 1 wherein the organ is a part of the urinary or reproductive system.

10. The invasive method of stimulating an organ of claim 1 wherein the organ is a part of the lymph node or pituitary systems.

11. The invasive method of stimulating a organ of claim 1 wherein the step of subjecting the organ to pressure pulses or acoustic shock waves includes the step of treating cirrhosis of the liver.

12. The invasive method of stimulating an organ of claim 1 wherein the step of subjecting the organ to pressure pulses or acoustic shock waves includes killing bacteria by destroying bacterial cell membranes or stimulating a biological defense mechanism within said organ by exposure to the acoustic shock waves.

13. The invasive method of stimulating an organ of claim 1 further comprises a step of administering one or more antibiotics or other drugs to a blood stream within the organ, the organ being stimulated by the pressure pulses or acoustic shock waves wherein the drugs can work faster and be more efficient.

14. The invasive method of stimulating an organ of claim 1 further comprises the step of:
transplanting the organ from a donor to a patient.

15. The invasive method of claim 14 wherein the organ is exposed to pressure pulses or shock waves after being transplanted into a patient.

16. The invasive method of claim 14 wherein the organ is exposed to pressure pulses or shock waves prior to being transplanted into a patient.

0092	11/239,251	09/29/2005	A Therapeutic Treatment for Infertility or Impotency
Publication Date: May 11, 2006 Grant Date: 10/13/2009		Publication No. US 2006/0100552 A1 Patent No. 7,601,127 Status: Maint Fee: all paid	

The method of treatment for a genital tissue or reproductive organ of an infertility or impotence diagnosed patient is disclosed. The treatment has the steps of activating an acoustic shock wave generator or source to emit acoustic shock waves; and subjecting the genital tissue, reproductive organ or the entire reproductive region of the body to the acoustic

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

shock waves stimulating said tissue, organ or body wherein the tissue, organ or body is positioned within a path of the emitted shock waves. The emitted shock waves can be convergent, divergent, planar or near planar.

1. The method of stimulation of a genital tissue or reproductive organ of an infertility or impotence diagnosed patient comprising the steps of:

activating an acoustic shock wave generator or source to emit pressure pulses including but not limited to very fast pressure pulses called acoustic shock waves directed toward the genital tissue or reproductive organ to impinge the genital tissue or reproductive organ with pressure pulses or shock waves having a low energy density in the range of 0.000001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle above 0.1 MPa and the time duration of the pressure pulse cycle is from a microsecond to about a second, rise times to the peak pressure of the positive part of the first pressure cycle being in the range of nano-seconds (ns) up to milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes of the positive part of the cycle similarly above 0.1 MPa but with rise times to a peak positive pressure of the positive part of the amplitude being below 100 ns, the duration of the shock wave is below 3 micro-seconds (μs) for the positive part of a cycle and above 3 micro-seconds for the negative part of a cycle;

subjecting the genital tissue, reproductive organ or the entire reproductive region of the body to the convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the genital tissue or reproductive organ stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the genital tissue or reproductive organ wherein the genital tissue or reproductive organ is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the genital tissue or reproductive organ or beyond the genital tissue or reproductive organ thereby passing the emitted waves through the genital tissue or reproductive organ while avoiding having any localized focal point within the genital tissue or reproductive organ wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>; and

stimulating said tissue, organ or body wherein the tissue, organ or body is positioned within a path of the emitted shock waves removed from any focal point of the emitted acoustic shock wave.

2. The method of stimulation of claim 1 wherein the emitted shock waves are convergent having one or more geometric focal points at a distance of at least X from the generator or source, the method further comprising positioning the genital tissue or reproductive organ at a distance less than the distance X from the source to position the one or more focal points

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

beyond the treatment site of the genital tissue or reproductive organ.

3. The method of stimulation of claim 1 further comprising the step of:
administering one or more medicaments prior, during or after subjecting the patient to acoustic shock waves.

4. The method of stimulation of claim 1 further comprising the step of:
testing the sperm count or viability of the male infertility or impotence diagnosed patient after exposure to one or more acoustic shock wave stimulations.

5. The method of stimulation of claim 1 further comprising the step of:
testing the oocyte viability or count of the female infertility or impotence diagnosed patient after one or more acoustic shock wave stimulations.

6. The method of stimulation of claim 1 further comprising the step of:
subjecting a genital tissue or reproductive organ to a surgical procedure to remove or repair some or all of any defects or degenerative genital tissues or reproductive organs.

7. The method of stimulation of claim 1 wherein the treated genital tissue or reproductive organ has an indication of one or more pathological conditions including:
infertility of oocyte or sperm, impotency, premenstrual syndrome, PMDD, stress urinary incontinence, polycystic ovarian disease, endometriosis, endometrial cancer, infertility, hormone imbalance, and tissue subjected to a variety of perturbations including hormone replacement therapy or chemical contraception.

8. The method of stimulation for a genital tissue or reproductive organ of an infertility or impotence diagnosed patient of claim 1 where the emitted shock waves have an energy density of less than 0.2 mJ/mm<2>.

9. The method of stimulation for a genital tissue or reproductive organ of an infertility or impotence diagnosed patient of claim 1 where the emitted shock waves have an energy density in the range of 0.0001 to 0.1 mJ/mm<2>.

10. The method of stimulation of a genital tissue or reproductive organ of an infertility or impotence diagnosed patient comprising the steps of:
activating an acoustic shock wave generator or source to emit pressure pulses including but not limited to very fast pressure pulses called acoustic shock waves directed toward the genital tissue or reproductive organ to impinge the genital tissue or reproductive organ with pressure pulses or shock waves having a low energy density in the range of 0.000001 mJ/mm<2 >to

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle above 0.1 MPa and the time duration of the pressure pulse cycle is from a microsecond to about a second, rise times to the peak pressure of the positive part of the first pressure cycle being in the range of nano-seconds (ns) up to milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes of the positive part of the cycle similarly above 0.1 MPa but with rise times to a peak positive pressure of the positive part of the amplitude being below 100 ns, the duration of the shock wave is below 3 micro-seconds (μs) for the positive part of a cycle and above 3 micro-seconds for the negative part of a cycle;
subjecting the genital tissue, reproductive organ or the entire reproductive region of the body to the convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the genital tissue or reproductive organ stimulating a cellular response in the absence of cellular damage evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the genital tissue or reproductive organ wherein the genital tissue or reproductive organ is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the genital tissue or reproductive organ or beyond the genital tissue or reproductive organ thereby passing the emitted waves through the genital tissue or reproductive organ while avoiding having any localized focal point within the genital tissue or reproductive organ wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>; and
stimulating said tissue, organ or body wherein the tissue, organ or body is positioned within a path of the emitted shock waves removed from any focal point of the emitted acoustic shock wave.

11. The method of stimulation of claim 10 wherein the emitted shock waves are convergent having one or more geometric focal points at a distance of at least X from the generator or source, the method further comprising positioning the genital tissue or reproductive organ at a distance less than the distance X from the source to position the one or more focal points beyond the treatment site of the genital tissue or reproductive organ.

12. The method of stimulation of claim 10 further comprising the step of:
administering one or more medicaments prior, during or after subjecting the patient to acoustic shock waves.

13. The method of stimulation of claim 10 further comprising the step of:
testing the sperm count or viability of the male infertility or impotence diagnosed patient after exposure to one or more acoustic shock wave stimulations.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

14. The method of stimulation of claim 10 further comprising the step of:
testing the oocyte viability or count of the female infertility or impotence diagnosed patient after one or more acoustic shock wave stimulations.

15. The method of stimulation of claim 10 further comprising the step of:
subjecting a genital tissue or reproductive organ to a surgical procedure to remove or repair some or all of any defects or degenerative genital tissues or reproductive organs.

16. The method of stimulation of claim 10 wherein the stimulated genital tissue or reproductive organ has an indication of one or more pathological conditions including:
infertility of oocyte or sperm, impotency, premenstrual syndrome, PMDD, stress urinary incontinence, polycystic ovarian disease, endometriosis, endometrial cancer, infertility, hormone imbalance, and tissue subjected to a variety of perturbations including hormone replacement therapy or chemical contraception.

17. The method of stimulation for a genital tissue or reproductive organ of an infertility or impotence diagnosed patient of claim 10 where the emitted shock waves have an energy density of less than 0.2 mJ/mm<2>.

18. The method of stimulation for a genital tissue or reproductive organ of an infertility or impotence diagnosed patient of claim 10 where the emitted shock waves have an energy density in the range of 0.00001 to 0.1 mJ/mm<2>.

0093	11/238,551	09/29/2005	Germicidal Method for Eradicating or Preventing the Formation of Biofilms

Publication Date: Oct 11, 2007 Publication No. US 2007/0239073 A1 Patent No: 7,497,834
Grant Date: 03/03/2009 Status: Maint Fee: all paid

A method of treatment for a tissue organ or entire body of a patient prior to or after exposure to a biofilm infection comprises the steps of activating an acoustic shock wave generator or source to emit acoustic shock waves; and subjecting the infected tissue, organ or entire body to the acoustic shock waves stimulating said tissue, organ or body wherein the tissue, organ or body is positioned within a path of the emitted shock waves.

1. The method of treating a host diagnosed with one or more biofilms, the biofilms having an outer barrier and an underlying colony of organisms comprises the steps of:
receiving a host diagnosed with one or more biofilms;

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

locating a region or location of a resident biofilm;

activating a pressure pulse or acoustic shock wave generating source, the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds ([mu]s) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle;

emitting pressure pulses or acoustic shock waves using focused pulses or shock waves at an energy density up to 1.0 mmJ/mm<2> ; with or without creating cavitation bubbles in the location or region of the resident biofilm, the focused pulses or shock waves having a focal volume or point on the location or region of the resident biofilm or using unfocused pulses or shock waves and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the location or region of a resident biofilm or beyond the location or region of a resident biofilm thereby passing the emitted waves or pulses through the location or region of a resident biofilm while avoiding having any localized focal point within the location or region of a resident biofilm wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 > to a high end of below 1.0 mJ/mm<2> ; and

directing the pulses or shock waves to impinge the resident biofilm to destroy, fracture, fragment or otherwise open the outer barrier structure of the resident biofilm.

2. The method of claim 1 further comprises the step of: stimulating cells of a host to initiate a cellular response within the host when the host is a living being with organs and tissues having a cellular structure, the stimulated cells assist in absorbing or otherwise eradicating the biofilm.

3. The method of claim 1 wherein the emitted pressure pulses or shock waves impinge the underlying organisms destroying or rupturing their outer membranes to germicidally kill the organisms.

4. The method of claim 1 further comprises the step of: administering one or more drugs, antibiotics or other medication to the host.

5. The method of claim 1 further comprises the step of: surgically exposing the region or location of the resident biofilm.

6. The method of treatment of claim 1 wherein the emitted shock waves are convergent, divergent, planar or near planar.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

7. The method of treatment of claim 1 wherein the emitted pressure pulses or shock waves are convergent having one or more geometric focal volumes of points at a distance of at least X from the generator or source, the method further comprising positioning the organ at a distance at or less than the distance X from the source.

8. The method of treatment of claim 1 further comprises the step of: administering one or more medicaments prior, during or after subjecting the patient to pressure pulses or acoustic shock waves.

9. The method of treatment of claim 1 further comprises the step of: subjecting a tissue or organ to a surgical procedure to remove some or all of a biofilm growth.

10. The method of claim 1 wherein the region or location is part of a system including the cardiovascular, urological, reproductive, digestive, intestinal, neurological or periodontal.

11. The method of claim 1 wherein the pathological or degenerative condition is a leaking valve in a heart.

12. The method of claim 1 wherein the pathological condition is a degenerative gum condition.

13. The method of claim 1 wherein the pathological condition is an infection.

14. The method of claim 1 wherein the infection is generally non-responsive to medications.

15. The method of preventively treating a patient at risk of developing a biofilm and becoming a host; comprises the steps of:
identifying an at risk patient with a pathological or degenerative condition susceptible to the generation of a biofilm;
treating the at risk patient by:
locating the location or region to be treated;
activating a pressure pulse or acoustic shock wave generating source, the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds ([mu]s) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and
emitting pressure pulses or acoustic shock waves using focused or unfocused pulses or shock waves at an energy density up to 1.0

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

mmJ/mm<2 > and directing the pulses or shock waves to impinge an area of the treatment region or location; in the absence of a focal point impinging the treatment region or location to stimulate a cellular response in the absence of creating cavitation bubbles in the location or region evidenced by not experiencing the sensation of hemorrhaging caused by the emitted waves or pulses wherein the area of the treatment region or location is away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the location or region of treatment or beyond the location or region of treatment thereby passing the emitted waves or pulses through the location or region of treatment while avoiding having any localized focal point within the location or region of treatment wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 > to a high end of below 1.0 mJ/mm<2> .

16. The method of claim 15 wherein the region or location is part of a system including the cardiovascular, urological, reproductive, digestive, intestinal, neurological or periodontal tissue.

17. The method of claim 15 wherein the pathological or degenerative condition is a leaking valve in a heart.

18. The method of claim 15 wherein the pathological condition is a degenerative gum condition.

19. The method of claim 15 wherein the pathological condition is an infection.

20. The method of claim 19 wherein the infection is generally non-responsive to medications.

0094	11/238,730	09/29/2005	A Method of Treatment for and Prevention of Periodontal Disease
Publication Date: Feb 16, 2006 Grant Date: 03/03/2009		Publication No. US 2006/0036194 A1 Patent No: 7,497,835 Status: Maint Fee: all paid	

The method of treatment for a periodontal tissue exhibiting a periodontal disease or periodontal condition in a diagnosed patient is disclosed. The method has the steps of activating an acoustic shock wave generator or source to emit acoustic shock waves; and subjecting the periodontal tissue, or the entire periodontal region of the patient to the acoustic shock waves stimulating said tissue, wherein the tissue is positioned within a path of the emitted shock waves. The method of

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

treatment may further have the steps of administering one or more medicaments prior, during or after subjecting the patient to acoustic shock waves or testing the bacterial count or viability of the treated tissue or region of the diagnosed patient after exposure to one or more acoustic shock wave treatments; or subjecting a tissue or organ to a surgical procedure to remove or repair some or all of any defects or degenerative tissues . The method of treatment is for prevention of periodontal disease and may be used with debridement. The treatment is particularly useful in eradicating and inhibiting periodontal biofilms.

1. The method of treatment for a periodontal tissue at risk for exhibiting a periodontal disease or periodontal condition in a diagnosed patient comprises the steps of:

receiving the diagnosed patient;

activating an acoustic shock wave or pressure pulse generator or source to emit pressure pulses or acoustic shock waves directed toward the periodontal tissue to impinge the periodontal tissue with shock waves or pressure pulses having a low energy density in the range of 0.00001 mJ/mm<2 > to 1.0 mJ/mm<2> , the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds ([mu]s) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and

subjecting the periodontal tissue, or the entire periodontal region of the patient to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses stimulating said tissue, wherein the tissue is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves or pressure pulses wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the periodontal tissue or beyond the periodontal tissue thereby passing the emitted waves or pulses through the periodontal tissue while avoiding having any localized focal point within the periodontal tissue wherein the emitted pressure pulses or shock waves are convergent, divergent planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 > to a high end of below 1.0 mJ/mm<2> .

2. The method of treatment of claim 1 wherein the emitted shock waves or pressure pulses are convergent having one or more geometric focal volumes of points at a distance of at least X from the generator or source, the method further comprising positioning the periodontal tissue at a distance at or less than the distance X from the source.

3. The method of treatment of claim 1 further comprises the step of:

administering one or more medicaments prior, during or after subjecting the patient to acoustic shock waves or pressure pulses.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

4. The method of treatment of claim 1 further comprises the step of:
testing the bacterial count or viability of the treated tissue or region of the diagnosed patient after exposure to one or more acoustic shock wave or pressure pulse treatments.

5. The method of treatment of claim 1 further comprises the step of:
subjecting the periodontal tissue to a surgical procedure to remove or repair some or all of any defects or degenerative tissues.

6. The method of treatment of claim 1 wherein the treated periodontal tissue has an indication of one or more pathological conditions including:
a periodontal biofilm mass, periapical endodontic lesions, endo-perio lesions, gingivitis, inflammation of gingival tissue, periodontitis, progressive loss of ligament, cementum or alveolar bone support to teeth.

7. The method of claim 1 wherein the treated tissue has one or more conditions requiring treatment as follows:
ridge augmentation for cosmetic, prosthetic or implantation of teeth; to assist osteoblastic and osteoclastic processes in orthodontia; regeneration of alveolar bone surrounding loose teeth implants regeneration of structures supporting the teeth including regeneration of structures supporting teeth including gingival, periodontal ligament, cementum and alveolar bone.

8. The method of claim 1 wherein the treatment is for prevention of periodontal disease.

9. The method of claim 8 further comprises the step of:
debridement.

10. The method of claim 8 wherein the treatment further comprises the step of:
destroying biofilm in or on the treated tissue or region.

11. The method of claim 8 wherein the treated tissue or region activates or otherwise stimulates stem cells or release of cellular growth factors in the oral structure effecting a tissue repair or tissue regeneration.

12. The method of treatment for a periodontal tissue at risk of or exhibiting a periodontal disease or periodontal condition in a diagnosed patient comprises the steps of:
receiving the diagnosed patient;
activating an acoustic shock wave or pressure pulse generator or source to emit pressure pulses or acoustic shock waves directed toward the periodontal tissue to impinge the periodontal tissue with shock waves having a low energy density in the range of

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

0.00001 mJ/mm<2 > to 1.0 mJ/mm<2> , the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds ([mu]s) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle;

subjecting the periodontal tissue, or the entire periodontal region of the patient to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses stimulating said tissue in the absence of creating cavitation bubbles in the treated periodontal tissue, wherein the tissue is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves or pressure pulses wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the periodontal tissue or beyond the periodontal tissue thereby passing the emitted waves or pulses through the periodontal tissue while avoiding having any localized focal point within the periodontal tissue wherein the emitted pressure pulses or shock waves are convergent, divergent planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 > to a high end of below 1.0 mJ/mm<2> ; and

wherein the periodontal tissue has cells and the shock waves or pressure pulses stimulate a cellular response in the tissue in the absence of cellular damage in the tissue caused by the shock waves or pressure pulses evidenced by the avoidance of localized hemorrhaging as a result of exposure to the emitted shock waves or pressure pulses.

13. The method of treatment of claim 12 wherein the tissue is gums.

14. The method of treatment of claim 12 wherein the step of subjecting the periodontal tissue to acoustic shock waves or pressure pulses stimulates at least some of said cells within said periodontal tissue to release or produce one or more of nitric oxygen (NO), vessel endothelial growth factor (VEGF), bone morphogenetic protein (BMP) or other growth factors.

15. The method of treatment of claim 12 further comprises the step of:

administering one or more medicaments prior, during or after subjecting the patient to acoustic shock waves or pressure pulses.

16. The method of treatment of claim 12 further comprises the step of:

testing the bacterial count or viability of the treated tissue or region of the diagnosed patient after exposure to one or more acoustic shock wave or pressure pulse treatments.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

17. The method of treatment of claim 12 further comprises the step of:
subjecting the periodontal tissue to a surgical procedure to remove or repair some or all of any defects or degenerative tissues.

18. The method of treatment of claim 12 wherein the treated periodontal tissue has an indication of one or more pathological conditions including:
a periodontal biofilm mass, periapical endodontic lesions, endo-perio lesions, gingivitis, inflammation of gingival tissue, periodontitis, progressive loss of ligament, cementum or alveolar bone support to teeth.

19. The method of claim 12 wherein the treated tissue has one or more conditions requiring treatment as follows:
ridge augmentation for cosmetic, prosthetic or implantation of teeth; to assist osteoblastic and osteoclastic processes in orthodontia; regeneration of alveolar bone surrounding loose teeth implants regeneration of structures supporting the teeth including regeneration of structures supporting teeth including gingival, periodontal ligament, cementum and alveolar bone.

20. The method of claim 12 wherein the treatment is for prevention of periodontal disease.

21. The method of claim 12 further comprises the step of:
debridement.

22. The method of claim 12 wherein the treatment further comprises the step of:
destroying biofilm in or on the treated tissue or region.

23. The method of claim 12 wherein the treated tissue or region activates or otherwise stimulates stem cells or release of cellular growth factors in the oral structure effecting a tissue repair or tissue regeneration.

0095	11/238,499	09/29/2005	Methods for Promoting Nerve Regeneration and Neuronal Growth and Elongation
Publication Date: Oct 11, 2007 Grant Date: 06/09/2009		Publication No. US 2007/0239080 A1 Patent No. 7,544,171 Status: Maint Fee: all paid	

A method of enhancing the regeneration of injured nerves has the step of administering an effective exposure of pressure pulses or acoustic shock waves in a pulse or wave pattern to the zone of injury of the nerve during the regeneration process. The inventive method may include enhancing the stimulation of neuronal cell growth or regeneration by administering an effective exposure of pressure pulses or acoustic shock waves in a pulse or wave pattern to stimulate neuronal cell growth or regeneration, wherein the administering of the treatment is applied to a patient who has a pathological condition where neuronal repair can be

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

facilitated including peripheral nerve damage caused by injury or disease such as diabetes, brain damage associated with stroke, and for the treatment of neurological disorders related to neurodegeneration, including Parkinson's disease, Alzheimer's disease and amyotrophic lateral, sclerosis multiple sclerosis and disseminated sclerosis. The treatment is ideally suited for neural regeneration after a degenerative condition due to any neurological infections or any other pathological condition.

1. A method of treating a patient having injured or otherwise diseased nerves to stimulate by accelerating or initiating the regeneration and repair of injured or diseased nerves which comprises the step of:

treating the patient with injured or damaged nerves;

activating an acoustic pressure pulse shock wave generator or source to emit a pressure pulse or acoustic shock waves from a shock wave head, the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and

subjecting the nerves to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the nerves stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of hemorrhaging in the nerve caused by the emitted waves or pulses wherein the nerve is positioned within an unobstructed path of the emitted shock waves or pressure pulses; and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the nerve or beyond the nerve thereby passing the emitted waves or pulses through the nerve while avoiding having any localized focal point within the nerve wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>; and by

administering an effective exposure of pressure pulses or acoustic shock waves in a pulse or wave pattern having a low energy density less than 1.0 mJ/mm<2 >per shock wave directly to a zone or treatment site of the injured or diseased nerves initiates or accelerates the regeneration and repair process wherein the zone or treatment site of the injured or diseased nerves is positioned directly in a path of the pulse or wave pattern in absence of any focal point or if a focal point exists, the zone or treatment site is positioned away from any focal point wherein the energy density is selected to avoid cell damage to the injured or otherwise diseased nerves within the treatment site or zone.

2. The method according to claim 1 wherein the nerve has been severed creating one or more ends of proximal stumps and distal

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

stumps and a pulse or wave pattern is administered to the ends of the proximal and distal stumps.

3. The method according to claim 2 wherein fibrin containing collagenase is used as adhesive for the stumps.

4. The method according to claim 2 wherein the ends are sutured.

5. The method according to claim 4 wherein the sutured region is coated with a fibrin and collagenase mixture.

6. The method according to claim 2 wherein the stumps of individual severed fascicle groups are separately co-apted.

7. The method according to claim 2 wherein a nerve graft is interposed between the stumps.

8. The method according to claim 7 wherein interfascicular nerve grafts are employed.

9. The method according to claim 1 wherein injury has resulted in neuroma in continuity.

10. The method according to claim 1 wherein the injured nerves are subjected to surgical repair prior to administering the exposure to pressure pulse or acoustic shock waves.

11. The method according to claim 1 wherein the method further comprises the step of:
administering one or more nerve regenerating medicaments to the patient.

12. A method of treating a patient with a neurological disorder or injury to the brain by treating the neuronal cells of the brain tissue to stimulate by accelerating and increasing nerve or neurological brain tissue growth or regeneration or repair comprises the steps of:
treating a patient with a neurological disorder or injury to the brain by treating the neuronal cells of the brain tissue;
activating an acoustic shock wave or pressure pulse generator or source to emit a pressure pulses or acoustic shock waves, the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and
subjecting the neuronal cells to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

absence of a focal point impinging the neuronal cells stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of hemorrhaging caused by the emitted waves or pulses in the neuronal cells wherein the neuronal cells are positioned within an unobstructed path of the emitted shock waves or pressure pulses; and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the neuronal cells or beyond the neuronal cells thereby passing the emitted waves or pulses through the neuronal cells while avoiding having any localized focal point within the neuronal cells of the brain wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>; and by

subjecting the neuronal cells of the neurological organ tissue or nerve tissue directly to the acoustic shock waves having a low energy density of less than 1.0 mJ/mm<2 >per shock wave stimulates said neuronal cells or brain tissue wherein the neuronal cells or brain tissue is positioned directly within a path of the emitted pressure pulses or acoustic shock waves in the absence of any focal point or if a focal point exists, the neuronal cells or brain tissue being treated is positioned away from any focal point wherein the energy density is selected to avoid any cell damage to the neuronal cells or brain tissue.

13. The method of treating neuronal cells to stimulate by accelerating or increasing neuronal cell growth or regeneration according to claim 12 wherein the administering is applied to a patient who has a pathological condition where neuronal repair can be facilitated including peripheral nerve damage caused by injury or disease such as diabetes, brain damage associated with stroke, and for the treatment of neurological disorders related to neurodegeneration, including Parkinson's disease, Alzheimer's disease and amyotrophic lateral sclerosis, multiple sclerosis and disseminated sclerosis.

14. The method of treating neuronal cells to stimulate by accelerating and increasing nerve or neurological brain tissue growth or regeneration or repair according to claim 12 wherein the emitted shock waves or pressure pulses are convergent having one or more geometric focal volumes or points at a distance of at least X from the generator or source, the method further comprising positioning the nerve or neurological brain tissue at a distance less than the distance X from the source.

15. The method of treating neuronal cells to stimulate by accelerating and increasing neuronal cell neurological brain tissue growth or regeneration or repair according to claim 12 wherein the neuronal cell or neurological brain tissue is from a mammal which is a human or an animal.

16. The method of treating neuronal cells to stimulate by accelerating and increasing cell or neurological brain tissue growth or regeneration or repair according to claim 12 wherein the step of subjecting the cells or neurological brain tissue to acoustic shock waves or pressure pulses includes killing bacteria by stimulating a biological defense mechanism within said cells or neurological

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

brain tissue by exposure to the acoustic shock waves or pressure pulses.

17. The method of treating neuronal cells to stimulate by accelerating and increasing cell or neurological brain tissue growth or regeneration or repair according to claim 12 further comprises a step of administering one or more antibiotics or other drugs to a blood stream feeding the nerve or neurological organ, the cell or neurological brain tissue being stimulated by the acoustic shock waves or pressure pulses.

0096	11/238,787	09/29/2005	Method of Stimulating Plant Growth

Publication Date: May 11, 2006 Grant Date: 10/13/2009	Publication No. US 2006/0100551 A1 Patent No. 7,600,343 Status: Maint Fee: all paid

The method of stimulating a plant substance is disclosed. The method has the steps of activating a pressure pulse or an acoustic shock wave generator or source to emit pressure pulse or acoustic shock waves; and subjecting the plant substance to the pressure pulse or acoustic shock waves stimulating said plant substance wherein the substance is positioned within a path of the emitted shock waves. In one embodiment the emitted pressure pulse or shock waves are divergent or near planar. In another embodiment the emitted shock waves are convergent having a geometric focal volume of point at a distance of at least X from the source, the method further comprising positioning the substance at a distance less than the distance X from the source. The substance is a plant tissue having cells. The tissue can be a seed, zygotic embryo or somatic embryogenic culture of somatic embryos of plants. The plant may be a vegetable, tree, shrub or tuber. The tissue may be a part of the root system, a part of the stem system or a part of the leaf system. The method of stimulating includes activating the cells within the treated tissue thereby releasing growth factor proteins or other chemical compositions promoting growth and accelerating germination or plant growth.

1. The method of stimulating a plant substance, the plant substance being a tissue having cells with cellular membranes, comprises the steps of:

activating a pressure pulse or an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves wherein the pressure pulses or acoustic shock waves are acoustic pulses which include several cycles of positive and negative pressure, the amplitude of the positive part of such a cycle being above 0.1 MPa having rise times of the positive part of the first pressure cycle amplitude being below 100's of ns and the duration being below 1 to 3 micro-seconds (μs) for the positive part of a cycle and above some micro-seconds for the negative part of a cycle; and

subjecting the plant substance to the pressure pulses or acoustic shock waves stimulating said substance with convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the plant substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of rupturing cellular membranes of the cells caused by the emitted waves or pulses in the cellular tissue of the plant

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

substance wherein the substance is positioned within a path of the emitted pressure pulses or shock waves away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the plant substance or beyond the plant substance thereby passing the emitted waves through the plant substance while avoiding having any localized focal point within the plant substance wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>, the stimulation having a dosage duration between a few seconds to 20 minutes or greater at an energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2 >per shock wave or less while avoiding or minimizing cell or membrane damage or rupturing by not creating cavitation bubbles in the tissue of the plant substance.

2. The method of stimulating a substance of claim 1 wherein the emitted pulses or shock waves are divergent or near planar having no geometric focal volume or point impinging the plant substance.

3. The method of stimulating a substance of claim 1 wherein the emitted pulses or shock waves are convergent having a geometric focal volume or point at a distance of at least X from the generator or source, the method further comprising positioning the substance at a distance less than the distance X from the source so as to avoid having a geometric focal volume or point impinging the plant substance.

4. The method of stimulating a plant substance of claim 1 wherein the tissue is one or more seeds of a plant.

5. The method of stimulating a plant substance of claim 4 wherein the plant is a tree.

6. The method of stimulating a plant substance of claim 4 wherein the plant is a bush.

7. The method of stimulating a plant substance of claim 4 wherein the plant is a vegetable.

8. The method of stimulating a plant substance of claim 4 wherein the plant is cotton.

9. The method of stimulating a plant substance of claim 4 wherein the plant is soybean.

10. The method of stimulating a plant substance of claim 4 wherein the plant is a flower.

11. The method of stimulating a plant substance of claim 1 wherein the plant is a tuber.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

12. The method of stimulating a plant substance of claim 1 wherein the tissue is one or more somatic embryos.

13. The method of stimulating a plant substance of claim 1 wherein the plant is asexually propagated.

14. The method of stimulating a plant substance of claim 13 wherein the plant is grafted.

15. The method of stimulating a plant substance of claim 13 wherein the plant is vegetative propagated by the rooting of cuttings.

16. The method of stimulating a plant substance of claim 13 wherein the plant tissue is micro-propagated from somatic embryos in vitro from minute pieces of tissue or individual cells.

17. The method of stimulating a plant substance of claim 1 wherein the tissue is a part of the root system.

18. The method of stimulating a plant substance of claim 1 wherein the tissue is a clone of the genetic system of a plant species.

19. The method of stimulating a plant substance of claim 1 wherein the tissue is one or more zygotic embryos.

0097	11/238,733	09/29/2005	Method of Shock Wave Treating Fish and Shellfish
Publication Date: Feb 16, 2006 Grant Date: 08/25/2009		Publication No. US 2006/0036196 A1 Patent No. 7,578,796 Status: Maint Fee: all paid	

The method of stimulating an aquatic life form is disclosed. The method has the steps of activating a pressure pulse or an acoustic shock wave generator or source to emit pressure pulse or acoustic shock waves; and subjecting the aquatic life form to the pressure pulse or acoustic shock waves stimulating said aquatic life form wherein the aquatic life form is positioned within a path of the emitted shock waves. The aquatic life form is a tissue having cells. The tissue can be an egg, zygotic embryo or larvae or an immature or a mature specimen. The aquatic life form may be a fish, shellfish, any crustacean, mussel, slam, oyster, abalone, scallop, shrimp, lobster, crab, crawfish, eel, octopus or any other aquatic life form. The method of stimulating includes activating the cells within the treated tissue thereby releasing growth factor proteins or other chemical compositions promoting growth and accelerating maturization. The tissue may be infected or exposed to infections from microbial sources such as microorganisms or viruses and the exposure to shock waves stimulates an activation of defenses of the immune system.

1. The method of stimulating an aquatic life form comprises the steps of:

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

activating a pressure pulse or an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves wherein the pressure pulses or acoustic shock waves are acoustic pulses which include several cycles of positive and negative pressure, the amplitude of the positive part of such a cycle being above 0.1 MPa having rise times of the positive part of the first pressure cycle amplitude being below 100's of ns and the duration being below 1 to 3 micro-seconds (μs) for the positive part of a cycle and above some micro-seconds for the negative part of a cycle; and

subjecting cellular tissue of the aquatic life form to the pressure pulses or acoustic shock waves stimulating said aquatic life form with convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the aquatic life form stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the cellular tissue of the aquatic life form wherein the cellular tissue of the aquatic life form is positioned within a path of the emitted pressure pulses or shock waves away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the aquatic life form or beyond the aquatic life form thereby passing the emitted waves through the aquatic life form while avoiding having any localized focal point within the aquatic life form wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/, the stimulation having a dosage duration between a few seconds to 20 minutes or greater at an energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2 >per shock wave or less while avoiding or minimizing cell or membrane damage or rupturing by not creating cavitation bubbles in the tissue of the aquatic life form.

2. The method of stimulating an aquatic life form of claim 1 wherein the emitted pulses or shock waves are divergent or near planar.

3. The method of stimulating an aquatic life form of claim 1 wherein the emitted pulses or shock waves are convergent having a geometric focal volume or point at a distance of at least X from the generator or source, the method further comprising positioning the aquatic life form at a distance less than the distance X from the source.

4. The method of stimulating an aquatic life form of claim 1 wherein the aquatic life form is tissue having cells.

5. The method of stimulating an aquatic life form of claim 4 wherein the tissue is one or more embryos, eggs or larvae or immature or not fully mature specimen of an aquatic life form.

6. The method of stimulating an aquatic life form of claim 5 wherein the life form is a fish.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

7. The method of stimulating an aquatic life form of claim 5 wherein the life form is a shellfish.

8. The method of stimulating an aquatic life form of claim 5 wherein the life form is a mollusk.

9. The method of stimulating an aquatic life form of claim 4 wherein the life form is a crustacean.

10. The method of stimulating an aquatic life form of claim 5 wherein the life form is shrimp.

11. The method of stimulating an aquatic life form of claim 5 wherein the life form is a scallop.

12. The method of stimulating an aquatic life form of claim 5 wherein the life form is an oyster.

13. The method of stimulating an aquatic life form of claim 4 wherein the life form is a clam.

14. The method of stimulating an aquatic life form of claim 4 wherein the life form is a lobster.

15. The method of stimulating an aquatic life form of claim 14 wherein the life form is a crab.

16. The method of stimulating an aquatic life form of claim 14 wherein the life form is an abalone.

17. The method of stimulating an aquatic life form of claim 4 wherein the aquatic life form tissue is infected or exposed to a viral or bacterial infection.

18. The method of stimulating an aquatic life form of claim 4 wherein the tissue has a degenerative condition or wound.

19. The method of stimulating an aquatic life form of claim 4 wherein the tissue is being treated with one or more anti-viral or anti-bacterial medications.

20. The method of stimulating an aquatic life form of claim 4 wherein the tissue is being treated with one or more vaccines or tolerines.

21. The method of germicidally cleaning a wound on an aquatic life form comprises the steps of:
activating a pressure pulse or an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves wherein the pressure pulses or acoustic shock waves are acoustic pulses which include several cycles of positive and negative pressure, the

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

amplitude of the positive part of such a cycle being above 0.1 MPa having rise times of the positive part of the first pressure cycle amplitude being below 100's of ns and the duration being below 1 to 3 micro-seconds (μs) for the positive part of a cycle and above some micro-seconds for the negative part of a cycle; and

subjecting the wound of the aquatic life form to the pressure pulses or acoustic shock waves thereby cleaning said wound wherein the wound is positioned within a path of the emitted pressure pulses or shock waves away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the wound or beyond the wound thereby passing the emitted waves through the wound while avoiding having any localized focal point within the wound wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>, the stimulation having a dosage duration between a few seconds to 20 minutes or greater at an energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2 >per shock wave or less while avoiding or minimizing cell or membrane damage or rupturing by not creating cavitation bubbles in the tissue of the aquatic life form.

DN0099	11/256,016	21/10/2005	Germicidal Method for Treating or Preventing Sinusitis

Publication Date: April 27, 2006 Grant Date: 03/03/2009	Publication No. US 2006/0089673 A1 Patent No: 7,497,836 Status: Maint Fee: all paid

The method of treatment for a nasal or sinus tissue exhibiting a sinusitis or rhinosinusitis disease or condition in a diagnosed patient is disclosed. The method has the steps of activating an acoustic shock wave generator or source to emit acoustic shock waves; and subjecting the nasal or sinus tissue, or the entire nasal or sinus region of the patient to the acoustic shock waves stimulating said tissue, wherein the tissue is positioned within a path of the emitted shock waves. The method of treatment may further have the steps of administering one or more medicaments prior, during or after subjecting the patient to acoustic shock waves or testing the bacterial count or viability of the treated tissue or region of the diagnosed patient after exposure to one or more acoustic shock wave treatments; or subjecting a tissue or organ to a surgical procedure to remove or repair some or all of any defects or degenerative tissues. The method of treatment is for prevention of infectious disease and may be used with debridement. The treatment is particularly useful in eradicating and inhibiting biofilm formations.

1. A method of treatment for a sinus or nasal tissue exhibiting a sinusitis or rhinosinusitis disease or condition in a diagnosed patient comprises the steps of:

receiving a diagnosed patient;

activating an acoustic shock wave or pressure pulse generator or source to emit low energy unfocused or focused acoustic shock

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

waves or pressure pulses in a path having a low energy density less than 1.0 mJ/mm<2 > per shock wave or pressure pulse, the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds ([mu]s) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and

subjecting the sinus or nasal tissue, or the entire sinus or nasal region of the patient to converging, diverging, planar or near planar acoustic shock waves or pressure pulses treatment energy density and treatment dosage stimulating said tissue, in the absence of creating cavitation bubbles in the sinus or nasal tissue, wherein the tissue is positioned within a path of the emitted shock waves or pressure pulses, in the absence of any acoustic focal point or if a focal point exists, the sinus or nasal tissue is positioned away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the tissue or beyond the tissue thereby passing the emitted waves or pulses through the tissue while avoiding having any localized focal point within the tissue wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 > to a high end of below 1.0 mJ/mm<2> ; wherein treatment energy density and treatment dosage are selected to avoid tissue damage within the sinus or nasal tissue as evidenced by the avoidance of cell hemorrhaging, the shock waves or pressure pulses having a low treatment energy density in the range of 0.00001 mJ/mm<2 > to less than 1.0 mJ/mm<2> .

2. The method of treatment of claim 1 further comprises the step of:

administering one or more medicaments prior, during or after subjecting the patient to acoustic shock waves or pressure pulses.

3. The method of treatment of claim 1 further comprises the step of:

testing the bacterial count or viability of the treated tissue or region of the diagnosed patient after exposure to one or more acoustic shock wave or pressure pulse treatments.

4. The method of treatment of claim 1 further comprises the step of:

subjecting a tissue to a surgical procedure to remove or repair some or all of any defects or degenerative tissues.

5. The method of treatment of claim 1 wherein the treated sinus or nasal tissue has an indication of one or more pathological conditions.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

6. The method of claim 1 wherein the treatment is for prevention of infectious disease.

7. The method of claim 6 further comprises the step of:
debridement.

8. The method of claim 6 wherein the treatment further comprises the step of:
destroying biofilm in or on the treated tissue or region.

9. The method of claim 6 wherein the treatment further comprises the step of:
destroying a tumor in or on the treated tissue or region.

10. The method of claim 6 wherein the treated tissue or region activates or otherwise stimulates stem cells or release of cellular growth factors in the nasal or sinus structure effecting a tissue repair or tissue regeneration.

DN0105	11/458,413	07/19/2006	Method of Attaching Soft Tissue To Bone

Publication Date: Jan 10, 2008	Publication No. US 2008/0009730 A1 Patent No. 7594930
Grant Date: 09/29/2009	Status: Maint Fee: all paid

A method of attaching or reattaching a ligament, tendon, cartilage or other soft tissue to a bone mass has the steps of: positioning or placing the ligament, tendon, cartilage or other soft tissue adjacent to the bone mass; anchoring or otherwise fastening the ligament, tendon, cartilage or soft tissue to the bone mass; and transmitting shock waves to the ligament, tendon or other soft tissue and the bone mass. Preferably the ligament, tendon, cartilage or other soft tissue is positioned in the path of the emitted shock waves and away from geometric focal volume or point of the emitted shock waves. The shock waves may be transmitted during the surgical procedure or post operatively in one or more treatment dosages or both. In so treating the ligament, tendon, cartilage or other soft tissue should be positioned at a distance away from any geometric focal point to minimize hemorrhaging. The soft tissue may include cartilage or muscle tissue. In the case of cartilage, the tissue can be inserted into a bone mass prepared cavity and optionally anchored there by a covering bone plug.

1. The method of attaching or reattaching a ligament, tendon or other soft tissues to a bone mass comprises the steps of:
positioning or placing the ligament, tendon, cartilage or other soft tissue in or adjacent to the bone mass;
anchoring or otherwise fastening the ligament, tendon, cartilage or other soft tissue to the bone mass;
transmitting pressure pulses including very fast pressure pulses called acoustic shock waves to the ligament, tendon, cartilage or other soft tissue and the bone mass from a pressure pulse shock wave generator or source wherein the pressure pulses or acoustic shock waves are acoustic pulses which includes several cycles of positive and negative pressure, wherein the pressure pulse has

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

an amplitude of the positive part of such a cycle above 0.1 MPa and the time duration of pressure pulse cycle is from 1 microsecond (μs) to a second (s), rise times to the peak pressure of the positive part of the first pressure cycle is in the range of 1 nano-second (ns) to 1 milli-second (ms), the acoustic shock waves being very fast pressure pulses having amplitudes of the positive part of the cycle similarly above 0.1 MPa but with rise times to a peak pressure of the positive part of the amplitude being below 100 ns, the duration of the shock wave is below 3 μs for the positive part of a cycle and above 1 μs for the negative part of a cycle; and

subjecting the ligament, tendon, cartilage or other soft tissue and the bone mass to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the soft tissue and bone mass stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the soft tissue wherein the cellular soft tissue is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cellular soft tissue or beyond the cellular soft tissue thereby passing the emitted waves through the cellular soft tissue while avoiding having any localized focal point within the cellular soft tissue wherein the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging from 0.00001 mJ/mrn<2 >to 1.0 mJ/mrn<2>.

2. The method of claim 1 wherein the pressure pulses or acoustic shock waves are transmitted during the surgical procedure after anchoring or otherwise fastening the ligament, tendon, cartilage or other soft tissue.

3. The method of claim 1 wherein the pressure pulses or acoustic_shock waves are transmitted post operatively in one or more treatment dosages.

4. The method of claim 1 wherein the transmitted pressure pulses or acoustic shock waves are divergent or near planar or wherein the emitted shock waves are convergent having a geometric focal volume or point at a distance of at least X from a generator or source, the method further comprising positioning the ligament, tendon, cartilage or other soft tissue at a distance less than the distance X from the source.

DN0112	11/676,761	02/20/2007	Pancreas Regeneration Treatment For Diabetics Using Extracorporeal Acoustic Shock Waves
Publication Date: 06/21/2007		Publication No. 2007/0142753 Patent No. 7,988,648	

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
Grant Date: 08/02/2011		Status: Maint Fee: all paid	

The method of stimulating a tissue of a subsurface organ is disclosed. The method has the steps of activating an acoustic shock wave generator or source to emit acoustic shock waves; and subjecting the tissue to the acoustic shock waves stimulating said tissue wherein the tissue is positioned within a path of the emitted shock waves and away from a geometric focal volume or point of the emitted shock waves. In one embodiment the emitted shock waves are divergent or near planar. In another embodiment the emitted shock waves are convergent having a geometric focal volume of point at a distance of at least X from the source, the method further comprising positioning the tissue at a distance less than the distance X from the source. The subsurface organ is a tissue having cells. The tissue is a part of the incretin system. The subsurface organ is preferably the pancreas of a diabetic or at risk diabetic patient. The treatment stimulates the pancreatic tissue by an analgesic effect on the nerves and a stimulation of the insulin producing islets.

1. The method of stimulating a tissue of a subsurface organ comprises the steps of:

treating the tissue of the subsurface organ;

activating an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves directed toward the tissue of the subsurface organ to impinge the tissue of the subsurface organ with pressure pulses or shock waves having a low energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle;

subjecting the tissue of the subsurface organ to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the tissue of the subsurface organ wherein the tissue of the subsurface organ is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the tissue of the subsurface organ or beyond the tissue of the subsurface organ thereby passing the emitted waves through the tissue of the subsurface organ while avoiding having any localized focal point within the tissue of the subsurface organ wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>.

2. The method of stimulating a tissue of a subsurface organ of claim 1 wherein the emitted shock waves are divergent or near planar.

3. The method of stimulating a tissue of a subsurface organ of claim 1 wherein the emitted shock waves are convergent having a geometric focal volume or point at a distance of at least X from the generator or source, the method further comprising positioning the tissue at a distance less than the distance X from the source.

4. The method of stimulating a tissue of a subsurface organ of claim 1 wherein the tissue is a tissue having cells.

5. The method of stimulating a tissue of a subsurface organ of claim 4 wherein the tissue is an organ of a mammal.

6. The method of stimulating a tissue of a subsurface organ of claim 5 wherein the mammal is a human or an animal exhibiting type 1 or type 2 diabetes condition.

7. The method of stimulating a tissue of a subsurface organ of claim 6 wherein the organ is a pancreas.

8. The method of stimulating a tissue of a subsurface organ of claim 6 wherein the organ is a liver.

9. The method of stimulating a tissue of a subsurface organ of claim 6 wherein the organ is a kidney.

10. The method of stimulating a tissue of a subsurface organ of claim 4 wherein the tissue is a part of the incretin system.

11. The method of stimulating a tissue of a subsurface organ of claim 10 wherein the tissue is a part of the incretin system, including alpha cells, beta cells, neural cells, nerve cells and islets for the production of insulin.

12. The method of stimulating a tissue of a subsurface organ of claim 11 wherein the tissue is a part of the pancreas.

13. The method of stimulating a tissue of a subsurface organ of claim 12 wherein the step of subjecting the tissue to acoustic shock waves creates an analgesic effect on the nerve cells sufficient to deactivate the pancreatic sensory nerves and to thereby stimulate the islets to begin producing insulin normally.

14. The method of stimulating a tissue of a subsurface organ of claim 12 wherein the step of subjecting the tissue to acoustic

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

shock waves reduces the chronic inflammation of islets of the pancreas.

15. The method of stimulating a tissue of a subsurface organ of claim 12 wherein the step of subjecting tissue to acoustic shock waves stimulates the nerve cells of the pancreas to secrete neuropeptides.

16. The method of stimulating a tissue of a subsurface organ of claim 12 wherein the step of subjecting the substance to acoustic shock waves stimulates at least some of said cells within said substance to release or produce one or more of nitric oxygen (NO), vessel endothelial growth factor (VEGF), bone morphogenetic protein (BMP) or other growth factors.

17. The method of stimulating a substance of claim 4 wherein the substance tissue has a pathological condition.

18. The method of stimulating a tissue of a subsurface organ of claim 12 wherein the organ is in a degenerative condition.

19. The method of stimulating a tissue of a subsurface organ of claim 12 further comprises the step of injecting neuropeptide substance P into the pancreas to stimulate the nerve cells and allow islets to produce insulin properly.

20. The method of preventive shock wave therapy comprises the steps of:
identifying a diabetic at risk patient, the patient having an at risk tissue;
treating the at risk tissue;
subjecting the at risk tissue to shock waves to stimulate tissue repair;
activating an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves directed toward the at risk tissue to impinge the at risk tissue with pressure pulses or shock waves having a low energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and
subjecting the at risk tissue to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the at risk tissue stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the at risk tissue wherein the at risk tissue is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

focal volume or point or have a focal volume or point ahead of the at risk tissue or beyond the at risk tissue thereby passing the emitted waves through the at risk tissue while avoiding having any localized focal point within the at risk tissue wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having anenergy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>.

21. The method of preventive shock wave therapy of claim 20 wherein the step of identifying an at risk patient includes one or more indications of risk based on family history, genetic disposition, physical condition, or blood or tissue analysis.

22. The method of preventive shock wave therapy of claim 20 further comprises the step of testing the at risk tissue to establish measured baseline condition pre shock wave therapy.

23. The method of preventive shock wave therapy of claim 22 further comprises the step of post shockwave therapy testing the treated tissue for comparison to the baseline condition.

DN0116	11/739,715	04/25/2007	Wound Care Bandaging In Combination With Acoustic Shock Wave Applications
Publication Date: 10/30/2008 Grant Date: 11/15/2011			Publication No. 2008/0269651 A1 Patent No. 8,057,411 Maint Fee: all paid

A method and device for treating wounds 10 of tissue 11 is disclosed. The method has the steps of applying a porous pad 12 upon the treatment surface of the tissue 11; covering the treatment surface and the porous pad 12 with a foil or sealing cover 14 for isolating the treatment surface and the porous pad 12 from the atmosphere; filling the volume under the foil or sealing cover 14 with fluid 100 and purging air from the volume under the foil or sealing cover 14 thereby fluid 100 saturating said porous pad 12: applying an acoustic shock wave treatment through the foil or sealing cover 14 or surrounding tissue 11 or a combination thereof sending acoustic shock waves 200 through the volume to the treatment surface and underlying tissue 11 and thereafter pulling a vacuum to create a sub-atmospheric pressure under the foil or sealing cover 14 wherein the combination of the applied acoustic shock waves 200 and sub-atmospheric conditions stimulates healing of the treatment surface and underlying tissue 11. Preferably the acoustic shock waves 200 are unfocused or a wide area focused shock wave pattern. More preferably the shock waves 200 are sufficiently low energy or amplitude to avoid the sensation of pain during the treatment process thereby eliminating the need for anesthesia or localized numbing of the treatment area.

1. An acoustic shock wave and vacuum wound treatment device for application to tissue, the device comprising:

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

a porous padding for application upon a treatment surface of the tissue;

an air tight water vapor permeable foil or sealing cover for covering the treatment surface and the porous padding which seals the treatment surface from air;

at least one fluid supply line for supplying fluid to the treatment surface and the porous pad;

at least one fluid removal line for removing fluid from the treatment surface and the porous padding, the removal line being to a vacuum line, wherein the introduction of fluids through the supply line in combination with the removal of fluids and entrapped air through the removal line thereby fluid saturates the porous pad and treatment surface; and wherein

an acoustic shock wave applicator head device being acoustically coupled to either the foil or sealing cover, the foil or sealing cover and adjacent tissue or the adjacent tissue for transmission of acoustic shock waves to the treatment surface through the fluid saturated porous padding, and wherein the transmission of acoustic shock waves are emitted from the shock wave applicator as pressure pulses or acoustic shock waves in a transmission dosage directed toward the treatment surface of the tissue to impinge the tissue of a wound with pressure pulses or shock waves having a low energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to a second, rise times of the positive part of the first pressure cycle being in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; wherein the transmission dosage subjects the tissue of the wound to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of increased cellular hemorrhaging in the tissue of the wound caused by the emitted waves or pulses in the tissue of the wound wherein the tissue of the wound is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the tissue of the wound or beyond the tissue of the wound thereby passing the emitted waves through the tissue of the wound while avoiding having any localized focal point within the tissue of the wound and wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>.

2. The acoustic shock wave and vacuum wound treatment device of claim 1 wherein the acoustic shock wave device transmits one of convergent, divergent, near planar or unfocused acoustic shock waves to the treatment surface and underlying tissue.

3. The acoustic shock wave and vacuum wound treatment device of claim 1 wherein said porous padding is comprised of an

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

elastic compressible porous material.

4. The acoustic shock wave and vacuum wound treatment device of claim 3 wherein the porous padding is comprised of an open pored polyvinyl alcohol-sponge foam material.

5. The acoustic shock wave and vacuum wound treatment device of claim 1 further comprises:
a controller;
a supply side valve;
a return side valve;
a vacuum line connected to the return side valve;
a supply side fluid pressure infusion line connected to the supply side valve; and
wherein the controller can actuate the supply side valve, the return side valve, the vacuum line or the pressure infusion line to provide a fluid filled infusion of said porous pad or a drainage of said porous pad and treatment surface or a combination thereof for simultaneous fluid infusion and vacuum drainage.

6. The acoustic shock wave and vacuum wound treatment device of claim 5 wherein after a fluid infusion wherein the return side valve is either closed or restricted there is created a fluid filled reservoir directly under the foil or sealing cover void of air; and wherein an acoustic shock wave treatment is applied through the foil or sealing cover, the tissue adjacent the sealing cover or a combination of the two passing through the fluid saturated porous padding to the treatment tissue and underlying tissue.

7. The acoustic shock wave and vacuum wound treatment device of claim 6 wherein the return side valve can be closed and vacuum applied through the vacuum line to create a sub atmospheric pressure to the treatment tissue which in combination with the administered acoustic shock waves stimulates the tissue to accelerate a rate of healing of the tissue of the wound.

8. A method of treating wounds of tissue comprises the step of:
applying a porous pad upon a treatment surface of the tissue, covering the treatment surface and porous pad with a sealing cover for isolating the treatment surface and the porous pad from the atmosphere, a space between the sealing cover and treatment surface form a volume;
filling the volume under the sealing cover with fluid and purging air from the volume under the sealing cover thereby fluid saturating said porous pad;
applying an acoustic shock wave treatment through the sealing cover or surrounding tissue or a combination thereof sending acoustic shock waves through the volume to the treatment surface and underlying tissue and wherein the transmission of acoustic shock waves are emitted from the shock wave applicator as pressure pulses or acoustic shock waves in a transmission dosage directed toward the treatment surface of the tissue to impinge the tissue of a wound with pressure pulses or shock waves having a

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

low energy density in the range of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2>; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to a second, rise times of the positive part of the first pressure cycle being in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; wherein the transmission dosage subjects the tissue of the wound to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of increased cellular hemorrhaging in the tissue of the wound caused by the emitted waves or pulses in the tissue of the wound wherein the tissue of the wound is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the tissue of the wound or beyond the tissue of the wound thereby passing the emitted waves through the tissue of the wound while avoiding having any localized focal point within the tissue of the wound and wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm<2 >to a high end of below 1.0 mJ/mm<2>;
and pulling a vacuum to create a sub-atmospheric pressure under the sealing cover, wherein the combination of applied acoustic waves and the sub-atmospheric conditions stimulate healing of the treatment surface and underlying tissue.

9. The method of treatment of claim 8 wherein the acoustic shock waves are unfocused or wide area focused shock wave pattern.

10. The method of treatment of claim 9 wherein the shock waves are of a sufficiently low energy or amplitude to avoid the sensation of pain.

11. The method of treatment of claim 9 wherein the treatment of the acoustic shock waves creates a germicidal effect on the porous pad and the treatment surface of the tissue, and a fluid drainage within the volume under the cover removes tissue toxins and other decomposition products.

12. The method of treatment of claim 8 further comprises the step of introducing a medicament antiseptic or antibiotic into the volume under the sealing cover prior to activation of the shock waves to stimulate absorption or covering of the treatment surface tissue during and after the shock wave treatment.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
DN0120	11/836,532	08/09/2007	Apparatus and Method for Cellular Extract Enhancement
Publication Date: 02/12/2009 Grant Date: 07/15/2014			Publication No. 2009/0041864 A1 Patent No. 8,778,414 Status: Maint Fee: due 01/16/2026

An apparatus 110 for increasing extracts 100E taken from cellular plant tissue 100 has a preparation container 114 for holding the cellular plant tissue 100, the container 114 having an inlet or opening 112 to receive a fluid 101 to wet the cellular plant tissue 100 and take extracts 100E from the cellular plant tissue 100 to create a fluid with extracts mixture 101E, and an outlet to pass the fluid with extracts mixture, a lower portion of the container is a holding vessel 111 to receive the fluid with extracts 101E; and an acoustic shock wave device 43 for transmitting shock waves 200 to the wet cellular plant tissue 100 to enhance release of extracts 100E into the fluid 101. The invention further discloses a method of increasing extracts 100E taken from cellular plant tissue 100 comprises the steps of placing prepared cellular plant tissue 100 in a container 114; introducing a fluid 101 into the container 114 to wet and immerse the prepared cellular plant tissue 100; and emitting acoustic shock waves 200 into the fluid 101 immersed cellular plant tissue 100 to increase the extracts 100E released by the plant tissue 100 into the fluid 101 and a product made from the method, the product being a beverage, medicine or drug.

1. An apparatus for increasing extracts taken from cellular plant tissue comprises:

a preparation container for holding the cellular plant tissue, the container having an inlet or opening to receive a fluid to wet the cellular plant tissue and take extracts from the cellular plant tissue to create a fluid with extracts mixture, and an outlet to pass the fluid with extracts mixture;

a holding vessel to receive the fluid with extracts; and

an acoustic shock wave device for generating and transmitting shock waves to the wet cellular plant tissue to enhance release of extracts into the fluid wherein the acoustic shock wave has a very rapid pressure spike the amplitude of the positive part is above 0.1 MPa and the cycle time duration is from below a microsecond to a second with the rise time of the positive part of the pressure cycle being in the range of nanoseconds up to milliseconds, achieved in an extremely short duration accordingly as the wave approaches a cell it compresses the cell initially, thereafter the pressure of the wave drops in a slower fashion as it continues across the cell that tends to put tension on the cell wall as it relaxes from the sudden compressive rise in pressure causing the cell wall to rebound in a spring like fashion and stretches slightly increasing permeability, rapid bombardment of the acoustic waves in a pattern sequence, which first compresses then stretches, and creates a rapid cellular squeezing effect enhancing permeability into and out of the cell walls wherein the cellular plant tissue is completely immersed in fluid with no air gaps or voids to impede the acoustic wave patterns, the acoustic shock wave device for generating and transmitting being an electro-hydraulic, electromagnetic, piezoceramic or ballistic device wherein the pressure pulse source is a point source generated by an electrical

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

discharge of an electrode, electromagnet or piezoceramic device under water or by an explosion to create acoustic shock waves exhibiting asymmetric ballistic pressure pulses for creating the rapid peak rise times.

2. The apparatus of claim 1 further comprises:
a heating element to heat the fluid prior to contacting the cellular plant tissue.

3. The apparatus of claim 1 further comprises:
a means to separate the fluid and extracts mixture from the cellular tissue wherein the cellular tissue is mechanically held as the fluid with extracts mixture passes to the holding vessel.

4. The apparatus of claim 1 wherein the acoustic shock wave device transmits the shock waves in a pattern covering a volumetric region of the held cellular tissue, the cellular tissue being immersed in the fluid.

5. The apparatus of claim 4 wherein the acoustic shock wave pattern is transmitted at least initially as the fluid passes through the cellular tissue.

6. The apparatus of claim 5 wherein the acoustic shock wave pattern is transmitted continuously as the fluid passes through the cellular tissue.

7. The apparatus of claim 5 wherein the transmission of the acoustic shock wave pattern is pulsed intermittently as the fluid passes through the cellular tissue.

8. The apparatus of claim 1 wherein the cellular plant tissue is ground coffee and the apparatus is coffee maker or coffee brewer.

9. The apparatus of claim 1 wherein the cellular plant tissue is coffee beans placed in a slurry to create a fluid with extract mixture to make an instant coffee product.

10. The apparatus of claim 1 wherein the cellular plant tissue is made of tea leaves and the apparatus is a tea maker.

11. The apparatus of claim 1 wherein the cellular plant tissue is one or more of the following; hops, barley, wheat, oats, soy beans or rice and the apparatus is used in brewing a beverage having an alcohol content.

12. The apparatus of claim 1 wherein the cellular plant tissue is used in the formulation of an extract for use in a drug or medicine composition.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

Divisional:

DN0120 DIV - 14/295,951 filed on 06-04-2014 US 2014-0287069 A1 09/25/2014

Status: Patented 6/23/2015 **US 9060525** Maint fee due 12/24/2026

1. A method of increasing extracts taken from cellular plant tissue comprises the steps of:
placing prepared cellular plant tissue in a container;
introducing a fluid into the container to wet and immerse the prepared cellular plant tissue;
emitting acoustic shock waves into the fluid immersed cellular plant tissue to increase the extracts released by the plant tissue into the fluid, and wherein the step of emitting includes the step of: transmitting shock waves to the wet cellular plant tissue to enhance release of extracts into the fluid wherein the acoustic shock wave has a very rapid pressure spike the amplitude of the positive part is above 0.1 MPa and the cycle time duration is from below a microsecond to a second with the rise time of the positive part of the pressure cycle being in the range of nanoseconds up to milliseconds, achieved in an extremely short duration, accordingly as the wave approaches a cell it compresses the cell initially, thereafter the pressure of the wave drops in a slower fashion as it continues across the cell that tends to put tension on the cell wall as it relaxes from the sudden compressive rise in pressure causing the cell wall to rebound in a spring like fashion and stretches slightly increasing permeability, rapid bombardment of the acoustic waves in a pattern sequence, which first compresses then stretches, and creates a rapid cellular squeezing effect enhancing permeability into and out of the cell walls, wherein the cellular plant tissue is completely immersed in fluid with no air gaps or voids to impede the acoustic wave patterns.

2. The method of claim 1 further comprises the step of:
heating the fluid prior to contacting the cellular plant tissue.

3. The method of claim 1 further comprises the step of:
separating the fluid and extracts mixture from the cellular tissue wherein the cellular tissue is mechanically held as the fluid with extracts mixture passes to the holding vessel.

4. The method of claim 1 further comprises the step of:
transmitting the shock waves in a pattern covering a volumetric region of the held cellular tissue as the cellular tissue is immersed in the fluid.

5. The method of claim 1 wherein the acoustic shock wave pattern is transmitted at least initially as the fluid passes through the cellular tissue.

6. The method of claim 1 wherein the acoustic shock wave pattern is transmitted continuously as the fluid passes through the cellular tissue.

7. The method of claim 1 wherein the transmission of the acoustic shock wave pattern is pulsed intermittently as the fluid passes through the cellular tissue.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

8. The method of claim 1 wherein the cellular plant tissue is ground coffee.

9. The method of claim 1 wherein the cellular plant tissue is coffee beans placed in a slurry to create a fluid with extract mixture to make an instant coffee product.

10. The method of claim 1 wherein the cellular plant tissue is made of tea leaves.

11. The method of claim 1 wherein the cellular plant tissue is one or more of the following; hops, barley, wheat, oats, soy beans or rice.

12. The method of claim 1 wherein the cellular plant tissue is used in the formulation of an extract for use in a drug or medicine composition.

DN0122 PROV	60/976,559	10/01/2007	Shock Wave Coupling Adapter and Method of Use Status: Provisional
DN0122	12/236,104	09/23/2008	Shock Wave Coupling Adapter and Method of Use

Publication Date: 04/02/2009	Publication No. US2009/0088670 A1 Patent No. 8529451
Grant Date: 09/10/2013	Status: Maint Fee due 03/10/2025 3080.00

A shock wave adapter for use with a focused shock wave applicator has a flexible, rigid or semi-rigid membrane or housing adapted to be filled with a fluid. The membrane or housing is devoid of any air or gases and when filled forms a spacer volume for passing acoustic shock waves at low impedance. The wave pattern of the shock wave applicator enters the membrane or housing as a converging wave form to a focus inside the membrane or housing and exits through the membrane or housing in a diverging wave form into the patient to be treated.

1. A spacer for positioning between a patient and the lens of a focused shock wave applicator, the spacer comprises;
a membrane being in the form of a bag-like structure or housing adapted to be filled with a fluid, the membrane or housing being devoid of any air or gasses, and when filled forms a spacer volume for passing acoustic shock waves at low impedance, wherein the space between the lens and the tissue is varied by the amount of fluid in the membrane and the wave pattern passing from the lens of the shock wave applicator enters through an oil or gel coated layer on the bag-like structure or housing and the lens as converging to a focus inside the membrane and exits through the opposite side of the membrane through an oil or gel coated layer

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

on the bag like structure or housing coupled to the tissue in a diverging wave form into the tissue to be treated, the membrane being a spacer positioned separate from but adjacent to the shock wave applicator between a lens of the shock wave applicator and the patient.

2. The spacer of claim 1 wherein the membrane is a bag made of a synthetic material.

3. The spacer of claim 2 wherein the membrane is made of latex polyurethane, silicon, polyethylene or a flexible thermoplastic material.

4. The spacer of claim 2 wherein the membrane further comprises a fluid valve for adding fluid.

5. The spacer of claim 2 wherein the membrane is pre-filled with a degased water based solution.

6. The spacer of claim 2 wherein the membrane is packaged in a sterility barrier packaging and sterilized prior to use.

7. The spacer of claim 2 wherein the membrane is reusable.

8. The spacer of claim 2 wherein the membrane is disposable.

9. A spacer for positioning between a patient and the lens of a focused shock wave applicator, the spacer comprises;
a membrane being in the form of a housing adapted to be filled with a fluid, the housing being devoid of any air or gasses, and when filled forms a spacer volume for passing acoustic shock waves at low impedance, wherein the space between the lens and the tissue is fixed by the size of the membrane and the wave pattern passing from the lens of the shock wave applicator enters through an oil or gel coated layer on the housing and the lens as converging to a focus inside the membrane and exits through the opposite side of the membrane through an oil or gel coated layer on the housing coupled to the tissue in a diverging wave form into the tissue to be treated, the membrane being a spacer positioned separate from but adjacent to the shock wave applicator between a lens of the shock wave applicator and the patient, wherein the housing is made of a thermoplastic material of low acoustic impedance.

10. The spacer of claim 9 wherein the housing is made of acrylic, polystyrene or polyethylene.

11. The spacer of claim 9 wherein the housing further comprises a fluid valve for adding fluid.

12. The spacer of claim 9 wherein the housing is pre-filled with a degased water based solution.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

13. The spacer claim 9 wherein the housing is packaged in a sterility barrier packaging and sterilized prior to use.

14. The spacer claim 9 wherein the housing is reusable.

15. The spacer claim 9 wherein the housing is disposable.

16. The spacer of claim 1 further comprises:
a gas filled shield located around the perimeter of the fluid filled membrane bag-like structure or housing.

17. A method of treating tissue with a focused shock wave generating source comprising:
establishing a distance from a shock wave lens to a theoretical focal point;
coating a fluid filled spacer with an oil or acoustic gel layer at locations between the lens and the spacer and similarly coating the fluid filled spacer a second location between the spacer and tissue to acoustically couple the two locations by placing the spacer between the lens and the tissue of the patient;
adjusting the space between the lens and the tissue by the amount of fluid in the spacer;
positioning the spacer between the tissue and the lens wherein the focal point when emitted is located inside the spacer; and
activating the focused shock wave generating source having the focal point impinge inside the spacer and exit as a divergent wave pattern into the tissue to be treated.

DN0126	11/959,868	12/19/2007	Pressure Pulse/Shock Wave Apparatus for Generating Waves Having Plane, Nearly Pane, Convergent Off Target or Divergent Characteristics
Publication Date: 06/19/2008		Publication No. US 2008/0146971 A1 Patent No. 8257282	
Grant Date: 09/04/2012		Status: Maint Fee: due 03/04/2024 3080.00	

An apparatus for generating pressure pulse /shock waves (PP/SWs) is disclosed which comprises a pressure pulse/shock wave (PP/SW) source, a housing enclosing said PP/SW source, and an exit window from which wave fronts of waves generated by said PP/SW source emanate. The wave fronts have plane, nearly plane, convergent off target or divergent characteristics. In one embodiment, an extracorporeal shock wave system provides a planar wave for the treatment of tissue. A parabolic reflector is provided in order to propagate the planar wave through a membrane and to the tissue of a human subject. A piezoelectric, electrohydraulic or electromagnetic source may be used to develop the wave.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

1. A therapeutic shock wave device for treating living tissue to produce a living tissue reaction in a subject to which the shock wave is administered comprising: a reflector housing; a parabolic reflector disposed in the housing; and an energy source disposed within the parabolic reflector for developing a shock wave so that a planar shock wave is formed by the parabolic reflector and emanates from the housing and is transferred to the living tissue; in the absence of a focusing lens through an exit window or membrane coupled to the tissue so that the emitted wave is transmitted unfocused from the exit window or membrane to the treated living tissue with reflected unfocused flat acoustic waves wherein the parabolic reflector is shaped and dimensioned to provide the planar shock wave having a power density level to produce a tissue reaction in a subject to which the wave is administered and wherein the shock wave has a power density in the range of approximately 0.01 mJ/mm<2 >up to 1.0 mJ/mm<2 >to stimulate the treated living tissue while avoiding tissue damage.

2. The device of claim 1, and further comprising a coupling member which intersects the reflector along a circle having a diameter in the range of approximately 20 mm to 100 mm.

3. The device of claim 1 wherein the parabolic reflector has an origin point and a focal point spaced from the origin point a distance in the range of approximately 3 mm to 10 mm.

4. The device of claim 1 wherein the energy source is an electrohydraulic source.

5. The device of claim 1 wherein the energy source has a propagation point centered approximately at a focal point of the parabolic reflector.

6. The device of claim 1 wherein the energy source comprises a pair of electrode tips connected to a capacitor.

7. The device of claim 6 wherein the energy source has a propagation point centered approximately between the electrode tips.

8. The device of claim 1 wherein the parabolic reflector includes a cavity having an opening and the opening sealed by a membrane.

9. The device of claim 8 wherein the cavity contains a fluid.

10. The device of claim 9 wherein the fluid is water.

DN0126 DIV 1 – 13/449,733 : Filed 04/18/2012 : Publication US2012203146 Patent No. 8,535,249

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

Status: Granted 09/17/2013 Maint fee due 03/17/2025 3080.00

1. Apparatus for generating pressure pulse/shock waves comprising:
a pressure pulse/shock wave (PP/SW) source;
a housing enclosing said PP/SW source; and
an exit window from which shock wave fronts of waves generated by said PP/SW source emanate, wherein said shock wave fronts have plane, nearly plane, convergent off target or divergent characteristics wherein the apparatus is shaped and dimensioned to provide the shock wave fronts having a power density level to produce a tissue reaction in a subject to which the wave is administered and wherein the waves have a power density in the range of approximately 0.01 mJ/mm<2 >up to 1.0 mJ/mm<2 >to stimulate a living tissue while avoiding tissue damage.

2. The apparatus of claim 1, wherein said PP/SW source comprises:
a pressure pulse/shock wave generating element for generating pressure pulses/shock waves;
a focusing element for focusing said waves into a focus volume outside the focusing element;
said apparatus further comprising a movable elongated mechanical element having a longitudinal axis;
wherein said focus volume is situated on or at said longitudinal axis; and
wherein said movable elongated mechanical element is movable to extend to or beyond said focus volume so that shock wave fronts with divergent characteristics emanate from said exit window.

3. The apparatus of claim 2, wherein said movable elongated element is part of said housing and said exit window is a window of the housing.

4. The apparatus of claim 2, wherein said focusing element is an acoustic lens, a reflector or a combination thereof.

5. The apparatus of claim 1, wherein said PP/SW source comprises a pressure pulse/shock wave generating element for generating pressure pulses/shock waves, and wherein said waves emanate from said exit window without being focused by a focusing element.

6. Apparatus of claim 1, wherein said PP/SW source comprises an electro hydraulic pressure pulse/shock wave generating element.

7. The apparatus according to claim 6, wherein said electro hydraulic pressure pulse/shock wave generating element comprising at least two electrodes, said PP/SW source further comprising a generalized paraboloid according to the formula y<n>=2px, wherein—x and y are carthesian coordinates, —p/2 is a focal point measured from an apex of the generalized paraboloid, and—n is about 1.2<2 or 2<about 2.8, with n≠2, said electrodes being positioned within said generalized paraboloid, and wherein a spark between tips of said electrodes is, with about +/−5 mm of variance, generated at the focal point p/2 of the generalized paraboloid.

8. The apparatus of claim 7, wherein burn down of the electrode tips (z) is compensated by the selection of (p+/−z) and n so that the resulting generalized paraboloid has a configuration between a paraboloid defined

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

by formula y<2>=2(p+z)x and a paraboloid defined by formula y<2>=2(p−z)x.

9. The apparatus of claim 7, wherein at least one of said electrodes is adjustable.

10. Apparatus of claim 1, wherein said PP/SW source comprises an electromagnetic pressure pulse/shock wave generating element.

11. Apparatus of claim 10, wherein said electromagnetic pressure pulse/shock wave generating element is an electromagnetic flat or curved emitter emitting waves having nearly plane or divergent characteristics, and wherein said waves emanate from said exit window without being modified by a lens.

12. Apparatus of claim 10, wherein said electromagnetic pressure pulse/shock wave generating element is an electromagnetic flat emitter emitting waves having nearly plane characteristics, and wherein said PP/SW source further comprises a lens for focusing said waves in a first focal point, wherein divergent waves are created behind said focal point emanate from said exit window.

13. Apparatus of claim 10, wherein said electromagnetic pressure pulse/shock wave generating element is an electromagnetic flat emitter emitting waves having nearly plane characteristics and wherein said PP/SW source further comprises a lens for de-focusing said waves so that waves with divergent wave characteristics emanate from said exit window.

14. Apparatus of claim 10, wherein said electromagnetic pressure pulse/shock wave generating element is an electromagnetic cylindrical emitter and wherein said PP/SW source further comprises at least one reflecting element and/or at least one lens.

15. Apparatus of claim 1, wherein said PP/SW source comprises a piezoceramic pressure pulse/shock wave generating element.

16. Apparatus of claim 15, wherein said piezoceramic pressure pulse/shock wave generating element is a piezoceramic flat or curved emitter emitting waves having nearly plane or divergent characteristics, and wherein said waves emanate from said exit window without being modified by a lens.

17. Apparatus of claim 15, wherein said piezoceramic pressure pulse/shock wave generating element is a piezoceramic flat emitter emitting waves having nearly plane characteristics, and wherein said PP/SW source further comprises a lens for focusing said waves in a first focal point, wherein divergent waves generated behind said first focal point emanate at said exit window.

18. Apparatus of claim 15, wherein said piezoceramic pressure pulse/shock wave generating element is a piezoceramic flat emitter emitting waves having nearly plane characteristics and wherein said PP/SW source further comprises a lens for de-focusing said waves so that waves with divergent wave characteristics emanate from said exit window.

19. Apparatus of claim 15, wherein said piezoceramic pressure pulse/shock wave generating element is a

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

piezoceramic cylindrical emitter and wherein said PP/SW source further comprises at least one reflecting element and/or at least one lens.

20. A therapeutic device for administering a shock wave to produce a living tissue reaction in a subject comprising:
a housing;
a shock wave source disposed in the housing;
wave directing and shaping structure in the housing responsive to the shock wave for causing a planar shock wave to be emitted from the housing and transferred to a living tissue;
structure for coupling the shock wave to the subject; and
wherein the device is shaped and dimensioned to provide the planar shock wave having a power density level to produce a tissue reaction in a subject to which the wave is administered and wherein the shock wave has a power density in the range of approximately 0.01 mJ/mm<2 >up to 1.0 mJ/mm<2 >to stimulate the living tissue while avoiding tissue damage.

21. The therapeutic device of claim 20 wherein the wave directing and shaping structure includes a parabolic reflector.

22. The therapeutic device of claim 20 wherein the housing includes an opening and the coupling structure includes a membrane disposed across the opening.

23. The therapeutic device of claim 22 wherein the wave directing and shaping structure is disposed in a cavity having the opening.

24. The therapeutic device of claim 20 wherein the shock wave source includes an electrode that develops a spark.

DN0288	15131303	Apr. 18, 2016	TREATMENTS FOR BLOOD SUGAR LEVELS AND MUSCLE TISSUE OPTIMIZATION USING EXTRACORPOREAL ACOUSTIC SHOCK WAVES

Maint Fee open 07/19/2025	US 2017-0296427 A1 10/19/2017 US patent 11,389,370 07/19/2022

A method of treating red blood cells of a human patient has the steps of activating an acoustic shock wave generator or source to emit acoustic shock waves and subjecting a vascular system containing red blood cells and surrounding muscle tissue peripherally through an extremity of a patient to the acoustic shock waves by stimulating the extremity wherein the extremity is positioned within a path of the emitted shock waves and away from a geometric focal volume or point of the emitted shock waves. The methods also treat muscle tissue of aging patients, from muscle regeneration or athletes for legal performance enhancement without drugs.

1. A method of lowering blood sugar level of a human patient exhibiting high blood sugar levels comprises the steps of:

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

measuring the human patient's blood sugar level prior to treating;
activating an acoustic shock wave generator or source to emit acoustic shock waves; and
subjecting a limb extremity of the human patient including a vascular system containing red blood cells and surrounding muscle tissue wherein the limb extremity is one of an arm, or a hand, or a leg, or a foot to the acoustic shock waves by stimulating through the limb extremity wherein the limb extremity of the human patient is positioned within a path of the emitted acoustic shock waves and away from a geometric focal volume or point of the emitted acoustic shock waves by emitting 500 or more shock waves at a low pulse energy of 0.1 mJ/mm<2 >or higher up to 1.0 mJ/mm<2 >to lower the patient's high blood sugar levels by emitting the acoustic shock waves through the limb extremity along a path through the skin and into muscle tissue, wherein the shock waves comprise amplitude above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of the acoustic shock waves being below 3 micro-seconds for a positive part of a cycle; and
measuring the patient's blood sugar level after the treatment wherein the human patient has an elevated baseline blood sugar level prior to treating the limb extremity which is lowered from the elevated baseline blood sugar level after treatment.

2. The method of lowering blood sugar level of a human patient of claim 1, wherein the emitted acoustic shock waves are divergent or near planar.

3. The method of lowering blood sugar level of a human patient of claim 1, wherein the emitted acoustic shock waves are convergent having a geometric focal volume or point at a distance of at least X from the acoustic shock wave generator or source, the method further comprising positioning the extremity at a distance less than the distance X from the generator or source.

4. The method of lowering blood sugar level of a human patient of claim 1, wherein the patient is diabetic exhibiting type 1 or type 2 diabetes condition.

5. The method of lowering blood sugar level of a human patient of claim 1 wherein the limb extremity is a leg.

6. The method of lowering blood sugar level of a human patient of claim 5, wherein the limb extremity is a foot.

7. The method of lowering blood sugar level of a human patient of claim 1, wherein the limb extremity is an arm.

8. The method of lowering blood sugar level of a human patient of claim 1, wherein repeating the treatment periodically a plurality of times over a period of weeks on the limb extremity to lower said baseline level of blood sugar.

DN0288DIV, divisional application filed 10/15/2021 US 17/502,778 Publication: US 2022/0031563 2/3/2022

Status: 10/27/2021 ready for examination

TREATMENTS FOR BLOOD SUGAR LEVELS AND MUSCLE TISSUE OPTIMIZATION USING EXTRACORPOREAL ACOUSTIC SHOCK WAVES

1. The method of preventive shock wave therapy comprises the steps of:
identifying a diabetic at risk patient, the patient having an at risk baseline blood sugar level; and
subjecting the at risk extremity to shock waves to lower said baseline sugar level.

2. The method of preventive shock wave therapy of claim 1 wherein the step of identifying an at risk patient includes one or more indications of risk based on family history, genetic disposition, physical condition, or blood or extremity analysis.

3. The method of preventive shock wave therapy of claim 1 further comprises the step of testing the at risk extremity to establish measured the baseline condition pre shock wave therapy.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

4. The method of preventive shock wave therapy of claim 1 further comprises the step of post shockwave therapy testing the blood sugar level for comparison to the baseline condition.

5. The method of treating red blood cells of a human patient of claim 1 wherein repeating the method periodically a plurality of times over a period of weeks to lower said baseline level of blood sugar.

6. A method of treating skeletal muscle tissue of an aging human patient comprises the steps of:
activating an acoustic shock wave generator or source to emit acoustic shock waves; and
subjecting surrounding muscle tissue peripherally to the acoustic shock waves by stimulating the muscle tissue wherein the muscle tissue is positioned within a path of the emitted shock waves and away from a geometric focal volume or point of the emitted shock waves.

7. The method of treating an aging human patient of claim 6 wherein the emitted shock waves are divergent or near planar.

8. The method of treating an aging human patient of claim 6 wherein the emitted shock waves are convergent having a geometric focal volume or point at a distance of at least X from the generator or source, the method further comprising positioning the extremity at a distance less than the distance X from the source.

9. The method of treating an aging human patient of claim 6 wherein the patient is exhibiting one or more impairments such as: age related skeletal muscle atrophy and sarcopenia resulting in the loss of muscle capacity and mass, progressive motor neuron degeneration, increases in fat mass, decreases in lean muscle, bone mass, and cellular environmental aberrances are commonly seen alterations of aging muscle, impairments in metabolic rate, aerobic capacity, strength and balance, functional capacity, along with emotional and cognitive distress.

10. The method of treating an aging human patient of claim 6 wherein the emitted shock waves are of a low intensity ranging from 0.10-0.12 mJ/mm<2>.

11. A method of treating skeletal muscle tissue of a human patient to optimize athletic performance and muscle resilience comprises the steps of:
activating an acoustic shock wave generator or source to emit acoustic shock waves; and
subjecting surrounding muscle tissue peripherally to the acoustic shock waves by stimulating the muscle tissue wherein the muscle tissue is positioned within a path of the emitted shock waves and away from a geometric focal volume or point of the emitted shock waves.

12. The method of treating a human patient to optimize athletic performance and muscle resilience of claim 11 wherein the emitted shock waves are divergent or near planar.

13. The method of treating a human patient to optimize athletic performance and muscle resilience of claim 11 wherein the emitted shock waves are convergent having a geometric focal volume or point at a distance of at least X from the generator or source, the method further comprising positioning the extremity at a distance less than the distance X from the source.

14. The method of treating a human patient to optimize athletic performance and muscle resilience of claim 11 wherein the patient is exhibiting one or more impairments such as: age related skeletal muscle atrophy and sarcopenia resulting in the loss of muscle capacity and mass, progressive motor neuron degeneration, increases in fat mass, decreases in lean muscle, bone mass, and cellular environmental aberrances are commonly seen alterations of aging muscle, impairments in metabolic rate, aerobic capacity, strength and balance, functional capacity, along with emotional and cognitive distress.

15. The method of treating a human patient to optimize athletic performance and muscle resilience of claim 11 wherein the emitted shock waves are of a low intensity ranging from 0.10-0.14 mJ/mm<2>.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

16. The method of treating a human patient to optimize athletic performance and muscle resilience of claim 11 wherein the emitted shock waves cause a quick removal of lactic acid from the cells of the muscle tissue allowing quicker muscle recovery.

17. The method of treating a human patient to optimize athletic performance and muscle resilience of claim 11 wherein the treatment causes rapid recovery from muscle cramping.

18. The method of treating a human patient to optimize athletic performance and muscle resilience of claim 11 wherein the treatment is used for erectile dysfunction or penis performance enhancement.

DN0300	15239323	Aug. 17, 2016	THERAPEUTIC TREATMENT FOR INCREASING TESTOSTERONE John Warlick
Status: 06/13/2023 RCE filed		Publication: US 2018-0049943 A1 02/22/2018	

The method of treatment for increasing testosterone levels of an adult male patient is disclosed. The treatment has the steps of activating an acoustic shock wave generator or source to emit acoustic shock waves; and subjecting a testicle through the scrotum to the acoustic shock waves stimulating said testicle wherein the testicle is positioned within a path of the emitted shock waves. The emitted shock waves can be convergent, divergent, planar or near planar.

1. The method of treatment for increasing testosterone levels in an adult male patient comprises the steps of:
activating an acoustic shock wave generator or source to emit acoustic shock waves; and
subjecting a testicle through the scrotum to the acoustic shock waves stimulating said testicle wherein the testicle is positioned within a path of the emitted shock waves.

2. The method of treatment of claim 1 wherein the emitted shock waves are convergent, divergent, planar or near planar.

3. The method of treatment of claim 1 wherein the emitted shock waves are convergent having one or more geometric focal volumes of points at a distance of at least X from the generator or source, the method further comprising positioning the organ at a distance at or less than the distance X from the source.

4. The method of treatment of claim 1 further comprises the step of:
testing the testosterone level of the patient prior to treatment.

5. The method of treatment of claim 1 further comprises the step of:
testing the testosterone level of the patient after exposure to one or more acoustic shock wave treatments within 72 hours post treatment.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
DN0328	15984505	May 21, 2018	IMPROVED ACOUSTIC SHOCK WAVE THERAPEUTIC METHODS Inventor: John F. Warlick

US 2019-0350803 A1 11/21/2019 US patent 11,389,371 07/19/2022

Maint Fee open 07/19/2025

CA filing 3026401 ref # P8190CA00

A method of modulating glandular secretions by administering acoustic shock waves to a gland, includes the steps of activating acoustic shock waves of an acoustic shock wave generator to emit acoustic shock waves and subjecting the gland to acoustic shock waves stimulating the gland to have a modulated response. The modulated response is one of an adjustment in hormonal release which increases low level output, decreases high level output or stabilizes erratic output. The emitted acoustic shock waves are focused or unfocused low energy acoustic shock waves. The gland underlies the patient's skin. The shock wave generator is acoustically coupled to the patient's skin using a coupling gel or liquid. The gland is one of a testicle, ovary, pituitary gland, adrenal gland, thyroid gland, thymus, pineal gland, parathyroid, or hypothalamus. The method can be repeated one or more times.

1. A method of modulating glandular secretions by administering acoustic shock waves to a gland of a patient, the gland is one of an ovary, a pituitary gland, an adrenal gland, a thyroid gland, a thymus, a pineal gland, a parathyroid, and a hypothalamus, the method comprises the steps of:
activating an acoustic shock wave generator to emit acoustic shock waves;
subjecting the gland to the acoustic shock waves to stimulate the gland to have a modulated response, wherein the modulated response is one of an adjustment in glandular secretions of hormonal release from the gland which increases low level hormonal output in the gland where the secretions are low relative to a normal level, or which decreases high level hormonal output in the gland where the secretions are high relative to a normal level, to stabilize erratic hormonal output in the gland to achieve the normal level of the glandular secretions; and
wherein the emitted acoustic shock waves are low energy soft waves, the soft waves being focused or unfocused acoustic shock waves having an energy density of less than 0.4 mJ/mm<2>, wherein the shock waves comprise amplitude above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of the acoustic shock waves being below 3 micro-seconds for a positive part of a cycle.

2. The method of claim 1, wherein the shock wave generator is acoustically coupled to the patient's skin using a coupling gel or liquid.

3. The method of claim 1, further comprising the step of stimulating the gland with a sufficient amount of acoustic shock waves to cause a release of nitric oxide.

4. The method of claim 3, further comprising the step of stimulating the gland with a sufficient amount of acoustic shock waves to cause a release of growth factors including Vascular Endothelial Growth Factor (VEGF).

5. The method of claim 4, further comprising the step of stimulating the gland with a sufficient amount of acoustic shock waves to cause new blood vessels to be created increasing vascularization.

6. The method of claim 1, is repeated one or more times.

7. The method of claim 1, wherein the low energy soft waves have the energy density in the range of 0.01 mJ/mm<2 >to 0.4 mJ/mm<2>.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

8. The method of claim 7, wherein the low energy soft waves have the energy density in the range of 0.04 mJ/mm<2 >to 0.3 mJ/mm<2>.

9. The method of claim 1, wherein the gland receives between 100 and 2000 acoustic shock waves per therapy session.

10. The method of claim 1, wherein the gland is an ovary.

11. The method of claim 10, wherein the modulated response is an increase in a hormonal release of estrogen wherein a patient was exhibiting low levels of estrogen relative to a normal level of estrogen.

12. The method of claim 10, wherein the modulated response is a decrease in a hormonal release of estrogen wherein a patient was exhibiting high levels of estrogen relative to a normal level of estrogen.

13. The method of claim 1, wherein the modulated response reduces panic attacks and anxiety by decreasing levels of adrenaline by the adrenal gland.

14. A method of modulating glandular secretions by administering acoustic shock waves to a testicle of a patient to decrease a level of testosterone within the patient, comprises the steps of:
activating an acoustic shock wave generator to emit acoustic shock waves;
subjecting the gland to acoustic shock waves to stimulate the testicle to have a modulated response wherein the modulated response is an adjustment in glandular secretions of testosterone from the testicle which decreases high level testosterone output in the testicle to stabilize erratic hormonal output in the testicle where the secretions are high relative to a normal level to achieve the normal level of testosterone secretions; and
wherein the emitted acoustic shock waves are low energy soft waves, the soft waves being focused or unfocused acoustic shock waves having an energy density of less than 0.4 mJ/mm<2>, wherein the shock waves comprise amplitude above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of the acoustic shock waves being below 3 micro-seconds for a positive part of a cycle.

DN0329	16009807	June 15, 2018	IMPROVED ACOUSTIC SHOCK WAVE THERAPEUTIC METHODS John F. Warlick, John Patrick Finney, Janey Lynn Watts

US 2018-0296432 A1 10/18/2018 US patent 11,389,372 07/19/2022

Maint Fee open 07/19/2025

CA filing 3028059 ref # P8193CA00

A method of modulating glandular secretions by administering acoustic shock waves to a reflexology zone or region has been discovered. In one preferred embodiment, a treatment method achieves one or more of a) modulating blood sugar levels, b) stimulating insulin production levels or c) normalizing A1C levels by using the step of administering acoustic shock waves to a reflexology zone or region. The treatment method further has the steps of: activating acoustic shock waves of an acoustic shock wave generator to emit acoustic shock waves; subjecting the reflexology zone to acoustic shock waves stimulating the pancreas to have a modulated response wherein the modulated response is one of an adjustment in blood sugar levels or insulin production and release or normalizing A1C levels which increases low level output, decreases high level output or stabilizes erratic output; and wherein the emitted acoustic shock waves are focused or unfocused acoustic shock waves.

1. A treatment method of treating a human patient exhibiting high or low blood sugar levels, high or low insulin production or abnormal A1C levels by achieving one or more of a) modulating blood sugar levels, b) stimulating insulin production levels or c)

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

normalizing A1C levels comprises the steps of:
activating an acoustic shock wave generator with a shock wave applicator to emit acoustic shock waves;
administering acoustic shock waves to a target site which is a reflexology zone of a patient, wherein the reflexology zone underlies the patient's skin in a region of a hand or foot and the reflexology zone lies in the path of the emitted shock waves by:
subjecting the reflexology zone to acoustic shock waves stimulating a patient's tissue at a reflexology location corresponding to a specific gland by emitting the acoustic shock waves to the tissue of the hand or foot at the reflexology zone is in the path of the emitted shock waves from the shock wave applicator causing the specific gland-to have a modulated response wherein the modulated response is one or more of an adjustment in blood sugar levels or insulin production and a release or normalizing A1C levels wherein the modulated response increases low level insulin output, decreases high level insulin output or stabilizes erratic insulin output; and
wherein the emitted acoustic shock waves are focused or unfocused acoustic shock waves, the emitted acoustic shock waves comprise an energy density of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2 >and an amplitude above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of the acoustic shock waves being below 3 micro-seconds for a positive part of a cycle.

2. The treatment method of claim 1, wherein the shock wave generator is acoustically coupled to the patient's skin using a coupling gel or liquid.

3. The treatment method of claim 1, wherein the reflexology zone for a pancreas is a region of the foot located in a middle of an inside arch of each foot.

4. The treatment method of claim 1, wherein the reflexology zone for a pancreas is a region of a right hand in a fatty part below an index finger of the right hand and a region of a left hand below a middle finger of the left hand close to a wrist of the left hand.

5. The treatment method of claim 1, further comprising the step of stimulating of the patient's tissue with a sufficient amount of acoustic shock waves to stimulate a pancreas to cause a release of nitric oxide, secretion of digestive enzymes, hormones and insulin.

6. The treatment method of claim 5, further comprising the step of stimulating of the pancreas with a sufficient amount of acoustic shock waves cause a release of growth factors including vascular endothelial growth factor (VEGF).

7. The treatment method of claim 6, further comprising the step of stimulating of the pancreas with a sufficient amount of acoustic shock waves cause new blood vessels to be created to increase vascularization.

8. The treatment method of claim 1, is repeated one or more times.

9. The treatment method of claim 8, wherein the number of repeated treatments occur on a schedule over a period of three or more weeks, and treatments is repeated over time as a risk prevention protocol over longer durations of time between repeated treatments.

10. The treatment method of claim 1, wherein the emitted acoustic shock waves are low energy soft waves.

11. The treatment method of claim 10, wherein the low energy soft waves have an energy density in a range of 0.01 mJ/mm<2 >to 0.4 mJ/mm<2>.

12. The treatment method of claim 11, wherein the low energy soft waves have an energy density in the range of 0.04 mJ/mm<2 >to 0.3 mJ/mm<2>.

13. The treatment method of claim 1, wherein each subjected reflexology zone receives between 100 and 2000 acoustic shock waves per therapy session.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

14. The treatment method of claim 1, wherein the modulated blood sugar level response is a decrease in the blood sugar level wherein the patient was exhibiting high levels of blood sugar.

15. The treatment method of claim 1, wherein the response to stimulating insulin production is an increase in insulin release wherein the patient was exhibiting low levels of insulin production.

16. The treatment method of claim 1, wherein the response of normalizing A1C levels is a decrease in spikes wherein the patient was exhibiting high levels of A1C spikes.

17. The treatment method of claim 1, wherein the acoustic shock waves are spherical, radial, convergent, divergent, planar, near planar, focused or unfocused from a source with or without a lens that is one of electrohydraulic, electromagnetic, piezoelectric, ballistic or water jets configured to produce an acoustic shock wave and wherein the acoustic shock waves are administered invasively or noninvasively.

18. The treatment method of claim 1, wherein the emitted acoustic shock waves are spherical, radial, convergent, divergent, planar, near planar, focused or unfocused from a source with or without a lens that is one of electrohydraulic, electromagnetic, piezoelectric, ballistic or water jets configured to produce an acoustic shock wave and wherein the acoustic shock waves are administered noninvasively.

19. A treatment method of treating a human patient exhibiting high or low blood sugar levels by achieving modulating blood sugar levels comprises the steps of:
activating an acoustic shock wave generator with a shock wave applicator to emit acoustic shock waves;
administering acoustic shock waves to a target site which is a reflexology zone of a patient, wherein the reflexology zone underlies the patient's skin in a region of a hand or foot and the reflexology zone lies in the path of the emitted shock waves by:
subjecting the reflexology zone to acoustic shock waves stimulating a patient's tissue at a reflexology location corresponding to a specific gland by emitting the acoustic shock waves to the tissue of the hand or foot at the reflexology zone is in the path of the emitted shock waves from the shock wave applicator causing the specific gland-to have a modulated response wherein the modulated response is an adjustment in blood sugar levels wherein the modulated blood sugar level response is a decrease in the blood sugar level wherein the patient was exhibiting high levels of blood sugar; and
wherein the emitted acoustic shock waves are focused or unfocused acoustic shock waves, the emitted acoustic shock waves comprise an energy density of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2 >and an amplitude above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of the acoustic shock waves being below 3 micro-seconds for a positive part of a cycle.

20. A treatment method of treating a human patient exhibiting high or low insulin production by stimulating insulin production levels comprises the steps of:
activating an acoustic shock wave generator with a shock wave applicator to emit acoustic shock waves;
administering acoustic shock waves to a target site which is a reflexology zone of a patient, wherein the reflexology zone underlies the patient's skin in a region of a hand or foot and the reflexology zone lies in the path of the emitted shock waves by:
subjecting the reflexology zone to acoustic shock waves stimulating a patient's tissue at a reflexology location corresponding to a specific gland by emitting acoustic shock waves to the tissue of the hand or foot at the reflexology zone is in the path of the emitted shock waves from the shock wave applicator causing the specific gland-to have a modulated response wherein the modulated response is an adjustment in insulin production wherein the response to stimulating insulin production is an increase in insulin release wherein the patient was exhibiting low levels of insulin production; and
wherein the emitted acoustic shock waves are focused or unfocused acoustic shock waves, the emitted acoustic shock waves comprise an energy density of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2 >and an amplitude above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of the acoustic shock waves being below 3 micro-seconds for a positive part of a cycle.

21. A treatment method of treating a human patient exhibiting abnormal A1C levels by normalizing A1C levels comprises the steps of:

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

activating an acoustic shock wave generator with a shock wave applicator to emit acoustic shock waves;
administering acoustic shock waves to a target site which is a reflexology zone of a patient, wherein the reflexology zone underlies the patient's skin in a region of a hand or foot and the reflexology zone lies in the path of the emitted shock waves by:
subjecting the reflexology zone to acoustic shock waves stimulating a patient's tissue at a reflexology location corresponding to a specific gland by emitting the acoustic shock waves to the tissue of the hand or foot at the reflexology zone is in the path of the emitted shock waves from the shock wave applicator causing the specific gland-to have a modulated response wherein the modulated response is normalizing A1C levels wherein the response of normalizing A1C levels is a decrease in spikes wherein the patient was exhibiting high levels of A1C spikes; and
wherein the emitted acoustic shock waves are focused or unfocused acoustic shock waves, the emitted acoustic shock waves comprise an energy density of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2 >and an amplitude above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of the acoustic shock waves being below 3 micro-seconds for a positive part of a cycle.

DN0330PROV DN0330	62687528 16353278	June 20, 2018 March 14, 2019	ACOUSTIC SHOCK WAVE THERAPEUTIC METHODS TO PREVENT OR TREAT OPIOID ADDICTION John F. Warlick, John Patrick Finney

US 2019-0209427 A1 07/11/2019 US patent 11,389,373 07/19/2022

Maint Fee open 07/19/2025

The method of treating a patient addicted to pain medication or opioids has the step administering acoustic shock waves or pressure pulses to the patient. A second embodiment includes a treatment to reduce a patient's pain caused by a medical condition and/or medical procedure to reduce or eliminate the taking of addictive pain medication. The treatment has the step of administering acoustic shock waves or pressure pulses directed to an area near a source of the pain or to one or more reflexology zones or to one or more reflexology zones and to an area near the source of the pain or both to treat the medical condition or prior to the medical procedure or during the medical procedure or after the medical procedure or any combination thereof.

1. A method of treating opioid or non-opioid addictive pain drug addicted patient comprises the steps of:
activating an acoustic shock wave generator to emit acoustic shock waves;
treating the addicted patient with the acoustic shock waves emitted by the acoustic shock waves generator, wherein the acoustic shock waves comprise a low pulse energy of 0.00001 mJ/mm<2 >or higher up to 1.0 mJ/mm<2 >and an amplitude above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of the acoustic shock waves being below 3 micro-seconds for a positive part of a cycle; and
the step of treating the addicted patient with the acoustic shock waves comprising subjecting adrenal glands of the addicted patient through a surface of a skin with the acoustic shock waves to modulate hormonal levels of the addicted patient by reducing adrenalin and cortisol levels in order to minimize withdrawal symptoms from the opioid or non-opioid addictive pain drug.

2. The method of claim 1 wherein the acoustic shock waves are directed towards a source of a chronic pain.

3. The method of claim 1 wherein the acoustic shock waves are directed to one or more reflexology zones of the hands or feet.

4. The method of claim 3 wherein the acoustic shock waves are directed to an entire hand or foot for systemic relief.

5. The method of claim 4 wherein the step of treating the addicted patient with acoustic shock waves reduces systemic inflammation, reduces anxiety, and improves sleep.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

6. The method of claim 5 wherein the withdrawal symptoms are minimized by stimulating the beta and/or alpha receptors which have a same symptomatic relief as pharmaceutical beta blockers.

7. The method of claim 3 further comprises the step of: recruiting, activating and differentiating stem cells of the patient by directly targeting pathologic tissues of the patient and/or by targeting the reflexology zones of the patient.

8. The method of claim 3 further comprises the step of: modulating inflammation locally by a direct targeting, or by modulating systemic inflammation by treating one or more of the reflexology zones.

9. The method of claim 1 further comprises the step of:
subjecting a location near a source of pain or to a reflexology zone to the acoustic shock waves to stimulate an area near the source of pain or in the reflexology zone to have a modulated response, wherein the modulated response is one or more of reducing patient anxiety by stimulating alpha and/or Beta adrenergic receptors to control and reduce high stress and anxiety or suppressing pain or activating an anesthetic effect over a period of time; and wherein the emitted acoustic shock waves are focused or unfocused acoustic shock waves.

10. The method of claim 9 wherein the administration of emitted shock waves is additionally directed to an area of the reflexology zone directed to modulate a response to the pain to suppress urges to take opioid or non-opioid addictive pain drug and to minimize withdrawal symptoms from opioid or non-opioid addictive pain drug.

DN0330PCT PCT/US19/30141 05/01/2019 WO 2019/245652 12/26/2019

DN0332PROV	62696022	July 10, 2018	IMPROVED ACOUSTIC SHOCK WAVE THERAPEUTIC METHODS
DN0332	17287630	04/22/2021	John F. Warlick, John Mullins, David Dean

US 2021-0393476 A1 12/23/2021

Status: pre-exam processing US national filed 04/22/2021 (PCT filed 05/01/2019)

A method of treating an infected implant by administering acoustic shock waves to an implant area or region encompassing an implantation, includes the steps of activating acoustic shock waves of an acoustic shock wave generator to emit acoustic shock waves and subjecting the implant area to acoustic shock waves stimulating the implant area or region. The emitted acoustic shock waves are focused or unfocused acoustic shock waves, or acoustic pressure waves, generated electrohydraulically, electromagnetically, radially, or via a piezo electric generating system.

1. A method of treating an infected implant by administering acoustic shock waves to an implant area or region encompassing an implantation, comprises the steps of:
activating acoustic shock waves of an acoustic shock wave generator to emit acoustic shock waves;
subjecting the implant area to acoustic shock waves stimulating the implant area or region; and
wherein the emitted acoustic shock waves are focused or unfocused acoustic shock waves.

2. The method of claim 1 wherein the implant area underlies the patient's skin.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

3. The method of claim 2 wherein the shock wave generator is acoustically coupled to the patient's skin using a coupling gel or liquid.

4. The method of claim 1 wherein the implant area is one of a ventricular assist device, driveline, hip implant, or other joint implant.

5. The method of claim 1 wherein the stimulating of the implant area causes a release of nitric oxide and reduces infection by destroying biofilms, staphylococcus or other infectious organisms.

6. The method of claim 5 wherein the stimulating of the implant area causes a release of growth factors including, but not limited to VGEF.

7. The method of claim 6 wherein the stimulating of the implant area causes new blood vessels to be created increasing vascularization.

8. The method of claim 1 is repeated one or more times.

9. The method of claim 1 wherein the emitted acoustic shock waves are low energy soft waves.

10. The method of claim 9 wherein the low energy soft waves have an energy density in the range of 0.01 mJ/mm<2 >to 0.4 mJ/mm square.

11. The method of claim 10 wherein the low energy soft waves have an energy density in the range of 0.04 mJ/mm<2 >to 0.3 mJ/mm square.

12. The method of claim 1 wherein the implant area or region receives between 100 and 2000 acoustic shock waves per therapy session.

13. The method of claim 4 wherein the implant area is a heart pump driveline.

DN0332PCT PCT/US19/30158 05/01/2019 WO 2020/013905 01/16/2020

CA filing 3026392 ref # P8207CA00 annuity paid 12/2022

DN0336PROV DN0336	62730608 16353365	Sept 13, 2018 March 14, 2019	ACOUSTIC SHOCK WAVE THERAPEUTIC METHODS TO TREAT MEDICAL CONDITIONS USING REFLEXOLOGY ZONES John F. Warlick, John Patrick Finney

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

US 2019-0209431 A1 07/11/2019 US patent 11,458,069 10/04/2022

Maint Fee open 10/04/2025

A treatment method to reduce or eliminate a patient's symptoms caused by a medical condition or disease is disclosed. The treatment has the step of administering acoustic shock waves or pressure pulses directed to one or more reflexology zones or to one or more reflexology zones and an area near a source of the pain if any is exhibited to treat the medical condition. The treatment further has the steps of activating acoustic shock waves or pressure pulses of an acoustic shock wave or pressure pulse generator to emit acoustic shock waves or pressure pulses and subjecting the one or more reflexology zones or the one or more reflexology zones and the area near a source of the medical condition or pain, if any is exhibited, to acoustic shock waves or pressure pulses to treat the medical condition.

1. A treatment method to treat a human patient's symptoms caused by a medical condition, the medical condition include an eosinophilic disorder of an internal organ, the treatment comprises the steps of:
activating an acoustic shock wave generator with a shock wave applicator to emit acoustic shock waves;
administering acoustic shock waves to a target site which is a reflexology zone of a patient, wherein the reflexology zone underlies the patient's skin in a region of a hand or foot or ear and the reflexology zone lies in the path of the emitted shock waves by:
subjecting the reflexology zone to acoustic shock waves stimulating a patient's tissue at the reflexology zone corresponding to the internal organ experiencing the medical condition by emitting the acoustic shock waves to the tissue of the hand or foot or ear at the reflexology zone that underlines the patient's skin in the path of the emitted shock waves from the shock wave applicator to cause a positive biologic response to treat the medical condition wherein the positive biologic response includes one or more of reducing or eliminating systemic or local inflammation and/or initiating, activating or recruiting stem cells, wherein stimulating the one reflexology zone or the reflexology zone and an area near a source of the medical condition causing a release of growth factors including vascular endothelial growth factor (VEGF) and wherein stimulating the reflexology zone or the reflexology zone and the area near the source of the medical condition causing new blood vessels to be created which would increase vascularization; and
wherein the emitted acoustic shock waves are focused or unfocused acoustic shock waves, the emitted acoustic shock waves comprise an energy density of 0.00001 mJ/mm<2 >to 1.0 mJ/mm<2 >and an amplitude above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of the acoustic shock waves being below 3 micro-seconds for a positive part of a cycle.

2. The treatment method of claim 1 wherein the acoustic shock wave generator is acoustically coupled to the patient's skin using a coupling gel or liquid.

3. The treatment method of claim 1 further comprising the step of stimulating the reflexology zone corresponding to the medical condition with a sufficient amount of acoustic shock waves to stimulate the orthopedic structure to cause the reflexology zone or the reflexology zone and the area near a source of the medical condition causes a stimulation or modulation of adrenergic receptors a and p and one or more of a release of nitric oxide, secretion of digestive enzymes, inflammation reduction, hormonal regulation and peptide recruitment and activation.

4. The treatment method of claim 1 is repeated one or more times to treat the medical condition.

5. The treatment method of claim 1 wherein the emitted acoustic shock waves or pressure pulses are low energy soft waves.

6. The treatment method of claim 5 wherein the low energy soft waves have an energy density in the range of 0.01 mJ/mm<2 >to 1.0 mJ/mm<2>.

7. The treatment method of claim 6 wherein the low energy soft waves have an energy density in the range of 0.04 mJ/mm<2 >to

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

0.5 mJ/mm<2>.

8. The treatment method of claim 1 wherein the subjected reflexology zone receives between 100 and 100,000 acoustic shock waves or pressure pulses per therapy session.

9. The treatment method of claim 1 wherein the emitted acoustic shock waves or pressure pulses are spherical, radial, convergent, divergent, planar, near planar, focused or unfocused from a source with or without a lens that is one of electrohydraulic, electromagnetic, piezoelectric, ballistic or water jets configured to produce an acoustic shock wave and wherein the acoustic shock waves or pressure pulses are administered invasively or noninvasively.

10. The treatment method of claim 4 wherein the number of repeated treatments occur on a schedule over a period of one or more weeks, and treatments are repeated over time as a pain prevention protocol over longer durations of time between repeated treatments.

11. The treatment method of claim 1 wherein the medical condition further comprising an auto immune indication and/or disorder.

12. The treatment method of claim 1 wherein the medical condition further comprising one of disorders of chronic local and systemic inflammation, congestive heart or lung failure, high or low eosinophils, Nocturia and benign prostatectomy hyperplasia, incontinence, interstitial cystitis, Trigonitis, Crohns, Rheumatoid arthritis, Multiple Sclerosis, irritable bowel syndrome, Primary myelofibrosis, Polycythemia vera, Thrombocythemia, Chronic Myelogenous Leukemia, Chronic Myelocytic Leukemia, Chronic Myeloid Leukemia, Chronic Granulocytic Leukemia, Sickle cell anemia.

13. The treatment method of claim 1 wherein the medical condition further comprising one of erectile dysfunction, reduced urine flow, or Nocturia, wherein Nocturia is defined as urinating at least 2 times per night.

14. The treatment method of claim 1 wherein the eosinophilic disorder is an eosinophilic disorder with elevated levels of eosinophils including one or more of Allergic disorders, Infections by parasites, cancers, asthma, allergic rhinitis, atopic dermatitis, Hodgkin lymphoma, leukemia, myeloproliferative disorders, Eosinophilic pneumonia of a lung, Eosinophilic cardiomyopathy of a heart, Eosinophilic esophagitis of an esophagus, Eosinophilic gastritis of a stomach, Eosinophilic enteritis of a small intestine.

15. The treatment method of claim 1 wherein the emitted acoustic shock waves or pressure pulses have an energy density in the range of 0.01 mJ/mm<2 >to 0.50 mJ/mm<2>.

16. The treatment method of claim 1 wherein the medical condition further comprising one of auto immune indications and/or disorders, disorders of chronic local and systemic inflammation, congestive heart or lung failure, high or low eosinophils, Nocturia, benign prostatectomy hyperplasia, incontinence, interstitial cystitis, Trigonitis, Crohns, Rheumatoid arthritis, Multiple Sclerosis, irritable bowel syndrome, Primary myelofibrosis, Polycythemia vera, Thrombocythemia, Chronic Myelogenous Leukemia, Chronic Myelocytic Leukemia, Chronic Myeloid Leukemia, Chronic Granulocytic Leukemia, Sickle cell anemia, Autism, Spina Bifida, Attention Deficit Hyperactivity Disorder, Hemorrhoids, Autism tremors, liver cancer, migraine, cystic fibrosis, Parkinson's disease, Colitis, Chronic Obstructive Pulmonary Disease, bronchitis, Lyme disease, Tip toe disease, Gall bladder infection, heart disease, Allergic disorders, Infections, Infections by parasites, cancers, asthma, allergic rhinitis, atopic dermatitis, Hodgkin lymphoma, leukemia, myeloproliferative disorders, Eosinophilic pneumonia of a lung, Eosinophilic cardiomyopathy of a heart, Eosinophilic esophagitis of an esophagus, Eosinophilic gastritis of a stomach, Eosinophilic enteritis of a small intestine.

DN0336PCT PCT/US19/30148 filed 05/01/2019 WO 2020/055458 03/19/2020

CA filing 3026371 ref # P8201CA00 annuity paid 12/2022

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
DN0346	16367989	03/28/2019	A HANDHELD ACOUSTIC SHOCK WAVE OR PRESSURE PULSE APPLICATION DEVICE AND METHODS OF USE John F. Warlick

US patent 11,311,454 04/26/2022

Maint fee open 04/26/2025

Abstract: A handheld acoustic shock wave or pressure pulse applicator device has a body structure and an applicator head. The body structure has a proximal end and a distal end with a longitudinal axis extending between the ends. The applicator head is at the distal end. the head emits pressure pulses or shock waves at an inclined angle relative to the longitudinal axis of the body structure. The applicator head has a balloon or lens or membrane through which the emitted pressure pulses or shock waves pass. The lens or membrane is configured to be coupled directly or indirectly to an exposed soft tissue surface of a palate inside a patient's mouth to direct emitted pressure pulses or shock waves to the brain. The applicator device can be configured with the inclined obtuse angle fixed between 150 degrees and 90 degrees or can be adjustable between 180 degrees and 90 degrees.

1. A handheld acoustic shock wave or pressure pulse applicator device comprises: a body structure having a main portion at a proximal end and a pivotable portion at a distal end, the body structure having a longitudinal axis extending between the ends; and an applicator head in the pivotable portion at the distal end pivotably connected to the main portion which emits pressure pulses or shock waves at an inclined angle relative to the longitudinal axis of the body structure, wherein the applicator head has a balloon or lens or membrane through which the emitted pressure pulses or shock waves pass wherein the lens or membrane is configured to be coupled directly by touching an exposed soft tissue surface of a palate inside a patient's mouth to direct emitted pressure pulses or shock waves to the brain, and
wherein an electrical cord extends from a proximal end of the main portion of the body structure and the pivotable portion has a pair of receptacles for receiving ends of a pair of electrodes in an applicator head structure, the applicator head structure when assembled to the pivotable portion forms an assembly connected to the main portion is electrically isolated such that when activated, a spark is generated between tips of the electrodes.

2. The applicator device of claim 1 wherein the inclined angle is obtuse fixed between 150 degrees and 90 degrees.

3. The applicator device of claim 1 wherein the inclined angle is adjustable between 180 degrees and 90 degrees.

4. The applicator device of claim 1 wherein a shock wave generator emits the shock wave through the applicator head by either electro hydraulic, electromagnetic, piezoelectric or ballistic wave emissions.

5. The applicator device of claim 4 wherein the wave emissions are focused, divergent, convergent, radial, spherical or unfocused waves.

6. The applicator device of claim 1 further comprises: a light.

7. The applicator device of claim 6 wherein the light is an LED, light emitting diode.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

8. The applicator device of claim 7 wherein the LED is in an upper surface of the applicator head structure.

9. The applicator device of claim 1 wherein the device is disposable after a single use.

10. The applicator device of claim 1 wherein the pair of electrodes are replaceable electrodes for refurbishing the device after use.

11. The applicator device of claim 1 wherein the pair of electrodes are fixed electrodes which are not adjustable and are pre-set at fixed gaps.

12. The applicator device of claim 1 wherein the pair of electrodes are adjustable electrodes.

13. The applicator device of claim 12 wherein the adjustable electrodes include one or more adjustment means, the means being magnets, piezo ceramic or motors with gear boxes, pneumatic or hydraulic to change a tip distance between the adjustable electrodes.

14. The applicator device of claim 1 further comprises: a reflector.

15. The applicator device of claim 14 wherein the reflector is a generalized paraboloid.

16. The applicator device of claim 14 wherein the reflector is an ellipsoid.

17. The applicator device of claim 16 wherein the wave emissions are transmitted at high energy or low energy.

18. The applicator device of claim 1 wherein the pivotable portion is connected to the body structure main portion via a pin and a nut, the pin and nut when tightened down fix the pivotable portion to be bent at any desired angle between 90 and 270 degrees.

19. The applicator device of claim 1 wherein applicator head structure and pivotable portion when assembled have a pair of electrical connectors that are slid through openings that will make contact with the electrical connectors completing a circuit.

20. The applicator device of claim 19 wherein the electrodes pass through an insulator sleeve and into the openings of the applicator head structure and when so positioned, ends of the electrodes are exposed.

21. The applicator device of claim 1 further comprises a boot, the boot encircles and seals the assembly of the applicator head structure to the pivotable portion.

22. The applicator device of claim 1 wherein the electrical cord is bifurcated into two portions forming a “Y” shape with a pair of electrical couplings crimped onto the “Y” shape portions.

23. The applicator device of claim 22 wherein electrical wiring of the electrical cord is passed through an opening in the body structure main portion of the device, the electrical couplings are crimped tightly onto exposed wire ends.

24. The applicator device of claim 23 wherein on each side of the pivoting connection are a pair of electrical connections, these electrical connections pass through a slot and are connected to the electrical couplings.

25. The applicator device of claim 1 further comprises a pair of O-rings that couple to grooves in the applicator device, the O-rings, when positioned, provide an air-tight seal for the membrane filled with a fluid creating an electrohydraulic shock wave applicator.

26. The applicator device of claim 1 wherein the longitudinal body structure main portion has a cover that covers the electrical components once the device is assembled.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
27. The applicator device of claim 1 wherein LED's, light emitting diodes, are positioned on a top and one or both sides of the device. 28. The applicator device of claim 1 wherein an LED is provided within an electrode chamber and the lens or covering membrane is translucent or transparent such that the LED is easily seen by the operator.			
DN0350PROV DN0350	62852683 16879979	05/24/2019 05/21/2020	DEVICE AND METHODS TO DESTROY BACTERIA, MOLDS, FUNGI AND VIRUSES AND FOR REDUCING INFLAMMATION AND MARKERS IN ORGANS AND TISSUE AND TO EXTEND THE UTILITY OF ANTIBIOTICS John F. Warlick

Status: 06/01/2023 advisory action US publication US2020368377 (A1) — 2020-11-26

A method of treating a patient having inflammation or an infection from bacteria or molds or fungi or virus by destroying bacteria or molds or fungi or virus has the step of directing one or more sound wave treatments into the patient to destroy bacteria or molds or fungi or virus. The sound wave treatments cause an improved blood supply, a disruption of cellular membranes and a cellular communication causing the patient's cells to identify and attack the bacteria, mold fungi or virus and further causes recruiting or stimulating an increase in anti-microbial peptides. The method further can have the step of administering medications to the patient including, but not limited to anti-viral medications, antibiotics, anti-fungal medications or anti-mold medications, wherein the sound wave treatment extends the useful life of the medications.

1. A method of treating a patient having an infection from bacteria or molds or fungi or virus by destroying bacteria or molds or fungi or virus comprising the step of:
directing one or more sound wave treatments into the patient to destroy bacteria or molds or fungi or virus.

2. The method of claim 1 wherein the sound wave treatments cause an improved blood supply, a disruption of cellular membranes and a cellular communication causing the patient's cells to identify and attack the bacteria, mold fungi or virus and further causes recruiting or stimulating an increase in anti-microbial peptides.

3. The method of claim 1 further comprises the step of:
administering medications to the patient including, but not limited to anti-viral medications, antibiotics, anti-fungal medications or anti-mold medications, wherein the sound wave treatment extends the useful life of the medications.

4. The method of claim 3 wherein the sound wave treatments increase the permeability of the patient's cell membranes allowing an increase in releasing anti-microbial peptides and inflow of the medications into the cells while increasing the blood supply toward the infection.

5. The method of claim 3 wherein the sound wave treatment is provided either prior to, during or after administering medications or any combination thereof.

6. The method of claim 5 wherein the infection's resistance to medications is reduced by the sound wave treatments.

7. The method of claim 5 wherein the medications effectiveness against the infection is enhanced by the sound wave treatments.

8. The method of claim 5 wherein the dosages or strength of the medications can be reduced when used in combination with the sound wave treatments.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

9. The method of claim 1 wherein the sound waves are acoustic shock waves.

10. The method of claim 9 wherein the acoustic shock waves are focused or non-focused, convergent, divergent, planar or nearly planar, radial or spherical, shaped or otherwise reflected.

11. The method of claim 10 wherein the sound wave treatments are emitted by a generator.

12. The method of claim 11 wherein the generator is one of a radial, a spherical, a ballistic, a linear, a piezoelectric, or an electrohydraulic generator.

13. The method of claim 1 wherein the sound wave treatments can be administered with or without cavitation.

14. The method of claim 1 wherein the sound wave treatments can be administered with or without some cellular destruction and with or without a sensation of pain.

15. The method of treating a patient diagnosed with one or more infections of a microbial or viral source, the infections causing at least localized inflammation, the method comprises the steps of:
locating a region or location of the infection;
activating a pressure pulse or acoustic shock wave generating source; and
emitting pressure pulses or acoustic shock waves and directing the pressure pulses or acoustic shock waves to impinge the inflammation directly or by indirectly impinging a reflexology zone to destroy, fracture, fragment or otherwise open the microbial or viral source to eradicate the source and reduce the inflammation.

16. The method of claim 15 further comprises the step of:
stimulating cells of a host to initiate a cellular response within the host when the host is a living being with organs and tissues having a cellular structure, the stimulated cells assist in absorbing or otherwise eradicating the microbial or viral source. fragment or otherwise open the microbial or viral source to eradicate the source and reduce the inflammation.

17. The method of claim 15 wherein the emitted pressure pulses or acoustic shock waves impinge the underlying bacterial or viral organisms destroying or rupturing their outer membranes to germicidally kill the organisms.

18. The method of claim 15 further comprises the step of:
administering one or more drugs, antibiotics or other medication to the host.

19. The method of claim 15 further comprises the step of:
surgically exposing the region or location of the infection.

20. The method of treatment of claim 15 wherein the emitted pressure pulses or acoustic shock waves are focused or non-focused waves of convergent, divergent, planar or near planar pattern.

21. The method of treatment of claim 15 wherein the emitted pressure pulses or acoustic shock waves are convergent having one or more geometric focal volumes of points at a distance of at least X from the generator or source, the method further comprising positioning the organ at a distance at or less than the distance X from the source.

22. The method of treatment of claim 15 further comprises the step of:
administering one or more medications prior, during or after subjecting the patient to pressure pulses or acoustic shock waves.

23. The method of treatment of claim 15 further comprises the step of:
subjecting a tissue or organ to a surgical procedure to remove some or all of an infection growth.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

24. The method of claim 15 wherein the region or location is part of a system including the cardiovascular, urological, reproductive, digestive, intestinal, neurological or periodontal.

25. The method of claim 15 wherein the pressure pulses or acoustic shock waves cause an upregulation or increase of antimicrobial peptides LL37

26. The method of claim 15 wherein the infection is generally non-responsive to medications.

27. A method of treating a patient having inflammation comprising the step of:
directing one or more sound wave treatments into the patient toward the inflammation.

28. The method of claim 27 wherein the sound wave treatments cause an improved blood supply, a disruption of cellular membranes and a cellular communication causing the patient's cells to identify the source of the inflammation and to reduce or eliminate the inflammation.

29. The method of claim 27 further comprises the step of:
administering medications to the patient including, but not limited to anti-viral medications, antibiotics, anti-fungal medications or anti-mold medications, wherein the sound wave treatment extends the useful life of the medications.

30. The method of claim 29 wherein the sound wave treatments increase the permeability of the patient's cell membranes allowing an increase in releasing anti-microbial peptides and inflow of the medications into the cells while increasing the blood supply toward the inflammation.

31. The method of claim 29 wherein the sound wave treatment is provided either prior to, during or after administering medications or any combination thereof.

32. The method of claim 31 wherein the inflammation's resistance to medications is reduced by the sound wave treatments.

33. The method of claim 31 wherein the medications effectiveness against the inflammation is enhanced by the sound wave treatments.

34. The method of claim 31 wherein the dosages or strength of the medications can be reduced when used in combination with the sound wave treatments.

35. The method of claim 27 wherein the sound waves are acoustic shock waves.

36. The method of claim 35 wherein the acoustic shock waves are focused or non-focused, convergent, divergent, planar or nearly planar, radial or spherical, shaped or otherwise reflected.

37. The method of claim 36 wherein the sound wave treatments are emitted by a generator.

38. The method of claim 37 wherein the generator is one of a radial, a spherical, a ballistic, a linear, a piezoelectric, or an electrohydraulic generator.

39. The method of claim 27 wherein the sound wave treatments can be administered with or without cavitation.

40. The method of claim 27 wherein the sound wave treatments can be administered with or without some cellular destruction and with or without a sensation of pain.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
DN0354 prov DN0354	62878455 16935361	07/25/2019 07/22/2020	A METHOD OF TREATING THE LOWER SPINE TO REDUCE OR ELIMINATE REFERRED OR NON-SPECIFIC PAIN (GHOST PAIN) IN THE PELVIS AND ABDOMEN INCLUDING THE BLADDER, PROSTATE, TESTICLES, GENITALIA AND DIGESTIVE TRACT John F. Warlick

Status: 06/12/2023 Appeal Brief filed US2021022956 (A1) 2021-01-28

A method of treating a patient exhibiting lower spine stenosis, inflammation, injury or disease has the steps of: activating an acoustic shock wave generator or source to emit acoustic shock waves from a shock wave head; and administering a plurality of acoustic shock waves in a pulse or wave pattern having a low energy density of less than 1.0 mJ/mm2 per shock wave directly onto a portion of a lower spine exhibiting chronic pain and inflammation. The chronic pain and inflammation radiates from the lower spine region to other organs causing chronic pain of one or more of an abdomen, a pelvis, or a groin and the step of administering a plurality of acoustic shock waves to the lower spine reduces chronic pain and inflammation radiating at the lower spine and further reduces chronic pain including orchialgia, prostatitis and bladder pain.

1. A method of treating a patient exhibiting abdominal or pelvic pain by applying shockwaves or acoustic pulses to the lower spine, lumbar and sacral spine, to modulate, reduce or relieve spinal stenosis, inflammation, injury or disease and comprises the steps of:
activating an acoustic shock wave or acoustic wave generator or source to emit acoustic shock waves or pulses from a fixed acoustic wave source or a handheld shock wave head or from electrodes embedded within a catheter with or without a fluid filled balloon catheter; and
administering a plurality of acoustic shock or acoustic waves in a pulse or wave pattern within the targeted tissue of less than 10.0 mJ/mm<2 >per shock wave, the plurality of acoustic shock or acoustic waves in a pulse or wave pattern should be directed to a portion of a lower spine exhibiting chronic pain and/or inflammation.

2. The method of claim 1 wherein the chronic pain and inflammation radiates from the lower spine region to other organs or connective tissue causing acute or chronic pain in the organs or connective tissue of the abdomen, pelvis, or genitalia.

3. The method of claim 1 wherein the step of administering a plurality of acoustic or shock waves to the lower spine reduces chronic pain and inflammation radiating at the lower spine and further reduces chronic pain including orchialgia, prostatitis, bladder pain, interstitial cystitis or digestive tract pain.

4. The method of claim 1 wherein the chronic pain and inflammation at the lower spine region radiates causing ghost or referred pain defined as non-specific pain at other organs or connective tissue and/or parts of the body and wherein the method further comprises the step of reducing ghost pain by administering the plurality of acoustic shock waves to the lower spine and locations at or near the areas exhibiting the ghost pain.

5. The method of claim 1 wherein the treatment is directed to treat women experiencing PGAD.

6. The method of claim 1 wherein the treatment is directed to treat patients having premature ejaculations.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
DN0356PROV	62932756	11/08/2019	DEVICE AND METHODS TO DESTROY BACTERIA, MOLDS, FUNGI AND VIRUSES AND FOR REDUCING INFLAMMATION AND MARKERS IN ORGANS AND TISSUE AND TO EXTEND THE UTILITY OF ANTIBIOTICS
DN0356	17097166	11/13/2020	John F. Warlick

Status: 06/07/2023 response to non final US2021059696 (A1) — 2021-03-04

A method of treating a patient having inflammation or an infection from bacteria or molds or fungi or virus by destroying bacteria or molds or fungi or virus has the step of directing one or more sound wave treatments into the patient to destroy bacteria or molds or fungi or virus. The sound wave treatments cause an improved blood supply, a disruption of cellular membranes and a cellular communication causing the patient's cells to identify and attack the bacteria, mold fungi or virus and further causes recruiting or stimulating an increase in anti-microbial peptides. The method further can have the step of administering medications to the patient including, but not limited to anti-viral medications, antibiotics, anti-fungal medications or anti-mold medications, wherein the sound wave treatment extends the useful life of the medications.

1. A method of treating a patient having an inflammation, infection from bacteria or molds or fungi or virus or cancerous cells by destroying bacteria or molds or fungi or virus or cancerous cells comprising the step of:
directing one or more sound wave treatments into the patient targeting the inflammation, infection, mold, virus, bacteria or fungi to cause a body to identify these as foreign objects and trigger the body's own natural healing mechanisms to destroy the foreign objects.

2. The method of claim 1 wherein the sound wave treatments include an improved long and short term blood supply, these mechanisms include both short and long term improvements in blood supply, an up regulation of anti-microbial peptides, especially peptide LL 37, a disruption of biofilms that protect these foreign objects, and an increase in cellular communication such that healthy cells identify these foreign objects as targets of the body's natural defenses, as the improved blood supply allows a body to deliver natural defenses and increases the supply of medications administered by a physician or other medications, a disruption of cellular membranes, increased cell membrane permeability, and an improvement in cellular communication causing the patient's cells to identify and attack the bacteria, mold, fungi or virus and further causes recruiting or stimulating an increase in anti-microbial peptides.

3. The method of claim 1 further comprises the step of:
administering medications to the patient including, but not limited to anti-viral medications, antibiotics, anti-fungal medications or anti-mold medications or anti-cancer medications, wherein the sound wave treatment improves the utility of these medications by increasing the amounts of these medications to the affected cells by increasing the short term and permanent blood supply to the cells and increasing the cellular communication to cause the body to aid in the fight against the foreign material.

4. The method of claim 3 wherein the sound wave treatments increase the permeability of the patient's cell membranes allowing an increase in releasing anti-microbial peptides and inflow of the medications into the cells while increasing the blood supply toward the infection.

5. The method of claim 3 wherein the sound wave treatment is provided either prior to, during or after administering medications or any combination thereof.

6. The method of claim 5 wherein the infection's resistance to medications is reduced by the sound wave treatments or the cellular permeability is increased to allow an increased amount of medicine to enter the cell or an increased amount of a body's natural

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

defenses to enter the cell, wherein the improved permeability allows more chemo to enter a cancerous cell.

7. The method of claim 5 wherein the medications effectiveness against the infection, or inflammation, or mold, or virus, or fungi, or cancer is enhanced by the sound wave treatments.

8. The method of claim 5 wherein the dosages or strength of the medications can be reduced when used in combination with the sound wave treatments.

9. The method of claim 1 wherein the sound waves are acoustic shock waves or pressure pulses.

10. The method of claim 9 wherein the acoustic shock waves or pressure pulses are focused or non-focused, convergent, divergent, planar or nearly planar, radial or spherical, shaped, linear or otherwise reflected or directed.

11. The method of claim 10 wherein the sound wave treatments are emitted by a generator or any mechanical device.

12. The method of claim 11 wherein the generator or mechanical device is one of a radial, a spherical, a ballistic, a linear, a piezoelectric, or an electrohydraulic or electromagnetic generator.

13. The method of claim 1 wherein the sound wave treatments can be administered with or without cavitation.

14. The method of claim 1 wherein the sound wave treatments can be administered with or without some cellular destruction and with or without a sensation of pain.

15. The method of treating a patient diagnosed with one or more infections of a microbial or viral source or foreign object such as mold, fungi or cancer, the infections causing at least localized inflammation, the method comprises the steps of:
locating a region or location of the infection;
activating a pressure pulse or acoustic shock wave generating source; and
emitting pressure pulses or acoustic shock waves and directing the pressure pulses or acoustic shock waves to impinge/decrease the inflammation or infection directly or by stimulating a reflexology zone in the hands or feet to trigger the body to destroy or reduce the inflammation, inflammation or foreign object.

16. The method of claim 15 further comprises the step of:
stimulating cells of a host to initiate a cellular response within the host when the host is a living being with organs and tissues having a cellular structure, the stimulated cells assist in absorbing or otherwise eradicating the microbial or viral or foreign object source by fragmentation or otherwise opening the microbial or viral or foreign object source to eradicate the source and reduce the inflammation.

17. The method of claim 15 wherein the emitted pressure pulses or acoustic shock waves impinge the underlying bacterial or viral or cancerous organisms destroying or rupturing their outer membranes exposing the organisms to a body's natural defenses or additional medications including chemotherapy and radiation.

18. The method of claim 15 further comprises the step of:
administering one or more drugs, antibiotics, chemotherapy or other medication to the host.

19. The method of claim 15 further comprises the step of:
surgically exposing the region or location of the infection or inflammation or cancer.

20. The method of treatment of claim 15 wherein the emitted pressure pulses or acoustic shock waves are focused or non-focused waves of one of convergent, divergent, spherical, linear, planar or near planar pattern, or any combination thereof.

21. The method of treatment of claim 15 wherein the emitted pressure pulses or acoustic shock waves are convergent having one

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

or more geometric focal volumes of points at a distance of at least X from the generator or source, the method further comprising positioning the organ at a distance at or less than the distance X from the source.

22. The method of treatment of claim 15 further comprises the step of:
administering one or more medications prior, during or after subjecting the patient to pressure pulses or acoustic shock waves.

23. The method of treatment of claim 15 further comprises the step of:
subjecting a tissue or organ to a surgical procedure to remove some or all of an infection growth.

24. The method of claim 15 wherein the region or location is part of a system including the cardiovascular, urological, reproductive, digestive, intestinal, neurological or periodontal.

25. The method of claim 15 wherein the pressure pulses or acoustic shock waves cause an upregulation or increase of antimicrobial peptides LL37.

26. The method of claim 15 wherein the infection is generally non-responsive to medications.

27. A method of treating a patient having inflammation comprising the step of:
directing one or more sound wave treatments into the patient toward the inflammation.

28. The method of claim 27 wherein the sound wave treatments cause an improved blood supply, a disruption of cellular membranes or an increased permeability of the cellular membrane, or increase cellular communication causing the patient's cells to identify the source of the inflammation or infection or cancer and to reduce or eliminate the inflammation, infection, or cancer or foreign object.

29. The method of claim 27 further comprises the step of:
administering medications to the patient including, but not limited to anti-viral medications, antibiotics, anti-fungal medications or anti-mold medications, wherein the sound wave treatment extends the useful life of the medications.

30. The method of claim 29 wherein the sound wave treatments increase the permeability of the patient's cell membranes allowing an increase in releasing anti-microbial peptides and inflow of the medications into the cells while increasing the blood supply toward the inflammation.

31. The method of claim 29 wherein the sound wave treatment is provided either prior to, during or after administering medications or any combination thereof.

32. The method of claim 31 wherein the inflammation's resistance to medications is reduced by the sound wave treatments.

33. The method of claim 31 wherein the medications effectiveness against the inflammation is enhanced by the sound wave treatments.

34. The method of claim 31 wherein the dosages or strength of the medications can be reduced when used in combination with the sound wave treatments.

35. The method of claim 27 wherein the sound waves are acoustic shock waves or pressure pulses.

36. The method of claim 35 wherein the acoustic shock waves or pressure pulses are focused or non-focused and one of convergent, divergent, planar or nearly planar, radial or spherical, shaped or otherwise reflected or directed patterns or any combination thereof.

37. The method of claim 36 wherein the sound wave treatments are emitted by a generator.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

38. The method of claim 37 wherein the generator is one of a radial, a spherical, a ballistic, a linear, a piezoelectric, or an electrohydraulic or electro magnetic generator.

39. The method of claim 27 wherein the sound wave treatments can be administered with or without cavitation.

40. The method of claim 27 wherein the sound wave treatments can be administered with or without some cellular destruction and with or without a sensation of pain.

41. The method of claim 28 wherein the inflammation is caused by one or more tumors and the patient's natural defenses are stimulated to reduce or eliminate the one or more tumors.

42. The method of claim 28 wherein the treatment is directed to the prostate or heart or inflamed tissue or any other organ including the skin reduces inflammation levels, and causes the PSA level of the prostate to be reduced decreasing or eliminating a cancer risk and causes the inflammation in the heart to be reduced preventing heart disease.

43. A method of treating a heart and/or arterial vascular plaque comprises the treating by sound waves the heart or arterial vascular system to stimulate the body to stop the recruitment of plaque or calcification to the aorta or heart, and causing the body to reabsorb the plaque or calcifications.

44. The method of claim 1 wherein the one or more sound wave treatments when directed to cancerous cells activates the natural defenses of the body to attack and destroy other cancer cells throughout the body.

45. The method of claim 44 wherein the exposure of the body to one or more sound wave treatments destroys the cancer cells within the body and vaccinates the patient from new cancer risk as the natural defenses of the body are programmed to identify and destroy cancer cells as foreign objects.

DN0359PROV	62963371	01/20/2020	A METHOD OF TREATING THE LUNGS
DN0359	16830924	03/26/2020	John F. Warlick, John Patrick Finney

Status: 05/22/2023 non final rejection US2021137543 (A1) — 2021-05-13

A method of treating a patient exhibiting a lung disease or pulmonary disorder by applying shock waves or acoustic pulses directed to impinge lung tissue of the lung or lungs exhibiting a lung disease or pulmonary disorder, has the steps of: activating an acoustic shock wave or acoustic wave generator or source to emit acoustic shock waves or pressure pulses from a fixed acoustic wave source or a handheld shock wave or pressure pulse head; and administering a plurality of acoustic waves in a pressure pulse or shock wave pattern within the lung tissue of less than 10.0 mJ/mm2 per shock wave, the plurality of acoustic waves in a pressure pulse or shock wave pattern being directed to a portion of the lung exhibiting the lung disease or pulmonary disorder.

1. A method of treating a patient exhibiting a lung disease or pulmonary disorder by applying shock waves or acoustic pulses directed to impinge lung tissue of the lung or lungs exhibiting a lung disease or pulmonary disorder, comprises the steps of:

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

activating an acoustic shock wave or acoustic wave generator or source to emit acoustic shock waves or pressure pulses from a fixed acoustic wave source or a handheld shock wave or pressure pulse head; and
administering a plurality of acoustic waves in a pressure pulse or shock wave pattern from an exit window or membrane of the fixed acoustic wave source or a handheld shock wave or pressure pulse head coupled to the patient's skin of less than 10.0 mJ/mm<2 >per shock wave or pressure pulse toward the lung tissue, the plurality of acoustic waves in a pressure pulse or shock wave pattern being directed to a portion of the lung exhibiting the lung disease or pulmonary disorder.

2. The method of claim 1 wherein the step of administering a plurality of acoustic waves delivered as shock waves or pressure pulses to the lung further reduces symptoms of the lung disease or pulmonary disorder.

3. The method of claim 1 wherein the lung disease or pulmonary disorder is one of asthma, bronchitis, Chronic Obstructive Pulmonary Disease (COPD), cystic fibrosis, emphysema, Idiopathic pulmonary fibrosis (IPF), flu, lung cancer, obstructive sleep apnea, pleurisy, pneumonia, or tuberculosis (TB).

4. The method of claim 1 wherein the treatment further comprises administering acoustic shock waves or pressure pulses directed to an area of the lung, or to a reflexology zone to treat the lung disease or pulmonary disorder.

5. The method of claim 1 wherein the reflexology zone is at an extremity of a limb.

6. The method of claim 1 wherein the extremity is a hand or foot.

7. The method of claim 1 wherein the plurality of acoustic waves in the pressure pulse or shock wave pattern from the exit window or membrane of the fixed acoustic wave source or handheld shock wave or pressure pulse head coupled to the patient's skin are less than 1.0 mJ/mm<2 >per shock wave or pressure pulse.

8. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is a spherical device.

9. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is a ballistic device.

10. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is a radial device.

11. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is an electrohydraulic device.

12. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is a piezoelectric device.

13. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is a laser device.

14. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is an electromagnetic device.

15. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is an ultrasound device.

16. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is a hybrid ultrasound device.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

17. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is a pulsed wave device.

18. The method of claim 1 wherein the acoustic shockwave or acoustic wave generator or source or handheld applicator or fixed applicator source is a continuous wave device.

19. A method to improve lung capacity by applying shock waves or acoustic pulses or continuous waves directed to tissue of the lung or lungs, comprises the steps of:
activating an acoustic shock wave or acoustic wave generator or source to emit acoustic shock waves or pressure pulses from a fixed acoustic wave source or a handheld shock wave or pressure pulse head; and
administering a plurality of acoustic waves in a pressure pulse or shock wave pattern from an exit window or membrane of the fixed acoustic wave source or a handheld shock wave or pressure pulse head coupled to the patient's skin of less than 10.0 mJ/mm2 per shock wave or pressure pulse toward the lung tissue, the plurality of acoustic waves in a pressure pulse or shock wave pattern being directed to a portion of the lung.

DN0359PCT PCT/US20/24898 filed 03/26/2020 WO 2021/091590 05/14/2021

DN0363PROV	63011653	04/17/2020	A METHOD OF TREATING THE BLOOD
DN0363	17223585	04/06/2021	John F. Warlick, Nikolaus Hopfenzitz

Status: 08/23/2021 ready for examination US 2021-0322664 A1 10/21/2021

A method of stimulating human blood external of a patient donor comprises the steps of: activating an acoustic shock wave or pressure pulse generator to emit acoustic shock waves or pressure pulses directed to impinge the blood; subjecting the blood to the acoustic shock waves or pressure pulses to form stimulated blood cells; and transfusing the stimulated blood cells into the patient donor. (Virus)

1. A method of stimulating human blood external of a patient donor comprises the steps of:
activating an acoustic shock wave or pressure pulse generator to emit acoustic shock waves or pressure pulses directed to impinge the blood;
subjecting the blood to the acoustic shock waves or pressure pulses to form stimulated blood cells; and
transfusing the stimulated blood cells into the patient donor.

2. The method of claim 1 wherein the patient donor is infected with a virus and the blood exhibits at least traces of the virus.

3. The method of claim 2 wherein the emitted acoustic shock waves or pressure pulses stimulating the stimulated blood cells fragment the virus in the blood.

4. The method of claim 3 wherein the fragmented virus in the blood transfused back into the patient donor triggers a defensive immune response to kill the virus.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

5. The method of claim 1 wherein the emitted acoustic shock waves or pressure pulses are of a low energy.

6. The method of claim 1 wherein the emitted shock waves or pressure pulses stimulate the blood cells and fragment the virus in the absence of cell damaging cavitation due to an elasticity in the blood cells and a lack of elasticity in the virus.

7. The method of claim 1 wherein the blood is not filtered.

8. The method of claim 1 wherein the blood can be oxygenated via Extracorporeal membrane oxygenation (ECMO) after being stimulated.

9. A composition of transfusable blood comprises:
a quantity of blood for transfusions; and
a plurality of fragmented viruses fragmented by acoustic shock waves or pressure pulses dispersed in the quantity of blood.

10. The composition of claim 9 wherein the plurality of fragmented viruses when transfused into a virus infected patient activates a defensive immune response to kill the virus in the transfused patient.

DN0386PROV DN0386	63211081 17750748	06/16/2021 05/23/2022	A METHOD OF TREATING UNINTENDED PARALYSIS CAUSED BY BOTOX John F. Warlick

Status: 07/08/2022 ready for examination US2022401294 (A1) — 2022-12-22

A method of treating a patient exhibiting paralysis by applying shockwaves or acoustic pulses to the affected region to reduce or relieve unintended paralysis has the steps of: activating an acoustic shock wave or acoustic wave generator or source to emit acoustic shock waves or pulses from a fixed acoustic wave source or a handheld shock wave head or from electrodes embedded within a catheter with or without a fluid filled balloon catheter; and administering a plurality of acoustic shock or acoustic waves in a pulse or wave pattern within the targeted tissue of less than 10.0 mJ/mm2 per shock wave, the plurality of acoustic shock or acoustic waves in a pulse or wave pattern should be directed to a portion of the affected region.

1. A method of treating a patient exhibiting a reaction to Botox by applying shockwaves or acoustic pulses to an affected region, to reduce or relieve unintended paralysis of muscles within the affected region comprises the steps of:
activating an acoustic shock wave or acoustic wave generator or source to emit acoustic shock waves or pulses from a fixed acoustic wave source or a handheld shock wave head or from electrodes embedded within a catheter with or without a fluid filled balloon catheter; and
administering a plurality of acoustic shock or acoustic waves in a pulse or wave pattern within the affected region of less than 10.0 mJ/mm<2 >per shock wave, the plurality of acoustic shock or acoustic waves in a pulse or wave pattern are directed to a portion of an affected region exhibiting the unintended paralysis of the muscles.

2. The method of claim 1 wherein the paralysis radiates from the affected region to adjacent connective tissue causing paralysis in the adjacent connective tissue.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

3. The method of claim 1 wherein the step of administering a plurality of acoustic or shock waves to the paralysis radiating at the affected region further reduces chronic pain, numbness and inflammation of the affected region.

DN0391	17825179	05/26/2022	METHOD AND DEVICE TO PRESERVE ORGANS AND TISSUE FOR TRANSPLANTATION John F. Warlick, John Mullins, David Dean

Status: 06/22/2022 ready for examination

A method of treating a harvested organ or tissue for preservation for implantation into a patient has the steps of, harvesting an organ or tissue from a donor; placing the harvested organ or tissue into a container; filling the container with a fluid for preservation; sealing the container once filled; directing one or more sound wave treatments into the container to destroy bacteria or molds or fungi or virus and to stimulate the organ or tissue; and storing the container at a hypothermic temperature of about 4 degrees C for storage prior to implantation.

1. A method of treating a harvested organ or tissue for preservation for implantation into a patient comprising the steps of:

harvesting an organ or tissue from a donor;

placing the harvested organ or tissue into a container;

filling the container with a fluid for preservation;

sealing the container once filled;

directing one or more sound wave treatments into the container to destroy bacteria or molds or fungi or virus and to stimulate the organ or tissue; and

storing the container at a hypothermic temperature of about 4 degrees C for storage prior to implantation.

2. The method of claim 1, wherein the container is configured to transmit sound waves through the container to the preservation fluid and the organ or tissue contained therein.

3. The method of claim 2, wherein the container is a flexible bag.

4. The method of claim 1, wherein the step of directing the one or more sound wave treatments includes placing an acoustic shock wave or pressure pulse emitting applicator against an external surface of the container.

5. The method of claim 1, wherein prior to sealing the container a vacuum is generated or the fluid overfilled to remove any

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

residual air.

6. The method of claim 5, wherein the container is a flexible bag and after sealing, secondarily sealing a perimeter of the bag to tension the bag and create a positive pressure inside the bag.

7. The method of claim 1, wherein the sound wave treatments cause an improved blood supply, a disruption of cellular membranes and a cellular communication causing the cells of the organ or tissue to identify and attack the bacteria or mold or fungi or virus and further causes recruiting or stimulating an increase in anti-microbial peptides.

8. The method of claim 1 further comprises the step of:

administering medications into the container including, but not limited to anti-viral medications, antibiotics, anti-fungal medications or anti-mold medications, wherein the sound wave treatment extends the useful life of the medications.

9. The method of claim 3 wherein the sound wave treatments increase the permeability of the organ or tissue cell membranes allowing an increase in releasing anti-microbial peptides and inflow of the medications into the cells while increasing the fluid and medications toward the bacteria or mold or fungi or virus.

10. The method of claim 8 wherein the sound wave treatment is provided either prior to, during or after administering medications or any combination thereof.

11. The method of claim 10 wherein an infection's resistance to medications is reduced by the sound wave treatments.

12. The method of claim 11 wherein the fluid preservative and medication's effectiveness against the infection is enhanced by the sound wave treatments.

13. The method of claim 8 wherein the dosages or strength of the medications can be reduced when used in combination with the sound wave treatments.

14. The method of claim 1 wherein the sound waves are acoustic shock waves or pressure pulses.

15. The method of claim 14 wherein the acoustic shock waves are focused or non-focused, convergent, divergent, planar or nearly planar, radial or spherical, shaped or otherwise reflected.

16. The method of claim 1 wherein the sound wave treatments are emitted by a generator.

17. The method of claim 16 wherein the generator is one of a radial, a spherical, a ballistic, a linear, a piezoelectric, or an electrohydraulic generator.

18. The method of claim 1 wherein the sound wave treatments can be administered with or without cavitation.

19. The method of claim 1 wherein the sound wave treatments can be administered with or without some cellular destruction and with or without a sensation of pain.

20. A method of treating an organ or tissue for transplantation with one or more infections of a microbial or viral source, the infections causing at least localized inflammation, the method comprises the steps of:

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

harvesting an organ or tissue from a donor;

locating a region or location of the infection;

activating a pressure pulse or acoustic shock wave generating source; and

emitting pressure pulses or acoustic shock waves and directing the pressure pulses or acoustic shock waves to impinge the inflammation directly or by indirectly impinging the organ or tissue to destroy, fracture, fragment or otherwise open the microbial or viral source to eradicate the source and reduce the inflammation;

placing the harvested organ or tissue into a container;

filling the container with a fluid for preservation;

sealing the container once filled;

directing one or more sound wave treatments into the container to destroy bacteria or molds or fungi or virus and to stimulate the organ or tissue; and

storing the container at a hypothermic temperature of about 4 degrees C for storage prior to implantation.

.21. The method of claim 20 further comprises the step of:

administering one or more drugs, antibiotics or other medication to the organ or tissue.

22. The method of treatment of claim 20 wherein the emitted pressure pulses or acoustic shock waves are convergent having one or more geometric focal volumes of points at a distance of at least X from the generator or source, the method further comprising positioning the organ at a distance at or less than the distance X from the source.

23. The method of treatment of claim 20 further comprises the step of:

subjecting a tissue or organ to a surgical procedure to remove some or all of an infection growth.

24. The method of claim 20 wherein the sound waves are acoustic shock waves or pressure pulses.

25. The method of claim 24 wherein the acoustic shock waves are focused or non-focused, convergent, divergent, planar or nearly planar, radial or spherical, shaped or otherwise reflected.

26. The method of claim 20 wherein the sound wave treatments are emitted by a generator.

27. The method of claim 20, wherein prior to sealing the container a vacuum is generated or the fluid overfilled to remove any residual air.

28. The method of claim 27, wherein the container is a flexible bag and after sealing, secondarily sealing a perimeter of the bag to tension the bag and create a positive pressure inside the bag.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
DN0392	63344720 18196636	05/23/2022 05/12/2023	ACOUSTIC SHOCK WAVE TREATMENT FOR ERECTILE DYSFUNCTION John F. Warlick, Irwin Goldstein

Status: non-provisional

A method of treatment for a penis of an adult postpubertal male patient, the treatment has of the steps of: causing an erection of a penis; activating an acoustic shock wave generator or source to emit low energy or unfocused acoustic shock waves and subjecting the erect penis to the acoustic shock waves stimulating said erect penis, the erect penis is positioned within a path of the emitted shock waves stimulating a cellular response.

1. A method of treatment for a penis of an adult postpubertal male patient, the treatment comprising of the steps of:

causing an erection of a penis;

activating an acoustic shock wave generator or source to emit low energy or unfocused acoustic shock waves, wherein the acoustic shock waves are waves having amplitudes above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of a shock wave being below 3 micro-seconds for the positive part of a cycle and wherein the pressure pulses are an acoustic pulse which includes several cycles of positive and negative pressure with amplitudes of the positive part of such a cycle being above 0.1 MPa and the pressure pulse time duration is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle is in the range of nano-seconds up to several milli-seconds; and

subjecting the erect penis to the acoustic shock waves stimulating said erect penis, the erect penis is positioned within a path of the emitted shock waves stimulating a cellular response.

2. The method of treatment of claim 1 wherein the emitted shock waves or pressure pulses are convergent, divergent, planar or near planar.

3. The method of treatment of claim 1 wherein the emitted shock waves or pressure pulses are convergent having one or more geometric focal volumes or points located at a distance X, X being defined as the distance from an exit window to the one or more focal volumes or points from the generator or source, the erect penis being positioned at the distance X or less than the distance X from the exit window source.

4. A method of treatment for increasing testosterone levels and increasing sperm count and viability in an adult postpubertal male patient comprising of the steps of:

testing the testosterone and sperm count and viability of a patient prior to treatment to establish a pre-treatment baseline level;

activating an acoustic shock wave or pressure pulse generator or source to emit low energy or unfocused acoustic shock waves or pressure pulses, wherein the acoustic shock waves are waves having amplitudes above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of a shock wave being below 3 micro-seconds for the positive part of a cycle and

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

wherein the pressure pulses are an acoustic pulse which includes several cycles of positive and negative pressure with amplitudes of the positive part of such a cycle being above 0.1 MPa and the pressure pulse time duration is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle is in the range of nano-seconds up to several milli-seconds;

subjecting a testicle through the scrotum to the acoustic shock waves or pressure pulses stimulating said testicle to increase testosterone levels and increase sperm count and viability, wherein the testicle is positioned within a path of the emitted shock waves stimulating a cellular response without creating cavitation bubbles insuring no hemorrhaging;

testing the testosterone level and sperm count and viability of the patient within 72 hours after subjecting the testicle to the acoustic shock waves or pressure pulses to establish a post treatment level; and

comparing the pre-treatment baseline level to the post treatment level tested after treatment to establish any increase.

DN0397	63391938 18196643	07/25/2022 05/12/2023	ACOUSTIC SHOCK WAVE TREATMENT AND DEVICES FOR APPENDAGES John F. Warlick, Irwin Goldstein

Status: non-provisional

An improved method of treating an appendage of a patient using acoustic shock waves has the steps of: providing an appendage in need of an acoustic shock wave treatment; placing an acoustic shock wave applicator on a surface of the appendage; placing a gaseous filled membrane on an opposite surface of the appendage; activating an acoustic shock wave generator or source to emit acoustic shock waves from an acoustic shock wave applicator; and wherein the acoustic shock wave is transmitted from the acoustic shock wave applicator through the surface sending the emitted acoustic shock waves into the tissue of the appendage and exiting the opposite surface of the appendage to the gaseous filled membrane where a reflection of the acoustic shock wave occurs sending reflected acoustic shock waves back through the appendage.

1. An improved method of treating an appendage of a patient using acoustic shock waves comprises the steps of:

providing an appendage in need of an acoustic shock wave treatment;

placing an acoustic shock wave applicator on a surface of the appendage;

placing a gaseous filled membrane on an opposite surface of the appendage;

activating an acoustic shock wave generator or source to emit acoustic shock waves from an acoustic shock wave applicator; and

wherein the acoustic shock wave is transmitted from the acoustic shock wave applicator through the surface sending the

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

emitted acoustic shock waves into the tissue of the appendage and exiting the opposite surface of the appendage to the gaseous filled membrane where a reflection of the acoustic shock wave occurs sending reflected acoustic shock waves back through the appendage.

2. The method of treating an appendage of a patient using acoustic shock waves of claim 1, wherein the step of activating the acoustic shock wave generator or source emits low energy or unfocused acoustic shock waves, wherein the acoustic shock waves are waves having amplitudes above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of a shock wave being below 3 micro-seconds for the positive part of a cycle and wherein the pressure pulses are an acoustic pulse which includes several cycles of positive and negative pressure with amplitudes of the positive part of such a cycle being above 0.1 MPa and the pressure pulse time duration is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle is in the range of nano-seconds up to several milli-seconds.

3. The method of treating an appendage of a patient using acoustic shock waves of claim 1 further includes subjecting the appendage to the acoustic shock waves stimulating said appendage, the appendage is positioned within a path of the emitted shock waves stimulating a cellular response.

4. The method of treating an appendage of a patient using acoustic shock waves of claim 1, wherein the gaseous filled membrane has an internal chamber filled with air, nitrogen or other inert gas, the chamber having a thickness of at least 1 cm or more.

5. The method of treating an appendage of a patient using acoustic shock waves of claim 4, wherein the gaseous filled membrane has an elastomeric conformable exterior surface that conforms to the shape of the surface when pressed against the appendage.

6. The method of treating an appendage of a patient using acoustic shock waves of claim 1, wherein the method further comprises the step of:

applying an acoustic gel to the surfaces of the appendage and the acoustic shock wave applicator and the gaseous filled membrane to acoustically couple the surfaces to enhance transmission of the acoustic shock waves.

7. The method of treating an appendage of a patient using acoustic shock waves of claim 6 further comprises the step of:

holding or pressing the applicator and the gaseous filled membrane firmly against opposing surfaces of the appendage to enhance the acoustic coupling.

8. The method of treating an appendage of a patient using acoustic shock waves of claim 7, wherein the acoustic shock wave applicator is electrohydraulic and has a fluid filled flexible membrane.

9. The method of treating an appendage of a patient using acoustic shock waves of claim 7, wherein the gaseous filled membrane is one of a balloon, or a mitten or a glove with the gaseous filled membrane on a palm side of the mitten or glove, and the method further comprises the step of holding the balloon against the appendage or donning the mitten or glove and holding the appendage against the palm side to reflect or absorb the emitted shock waves.

10. The method of treating an appendage of a patient using acoustic shock waves of claim 1 wherein the appendage is of one of a hand, a foot, a penis, or a scrotum.

11. The method of treating an appendage of a patient using acoustic shock waves of claim 10, wherein the appendage is a penis of an adult post pubertal male and the penis exhibits erectile dysfunction.

12. The method of treating an appendage of a patient using acoustic shock waves of claim 1, wherein the emitted shock waves or

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

pressure pulses are convergent, divergent, planar or near planar.

13. The method of treating an appendage of a patient using acoustic shock waves of claim 1, wherein the emitted shock waves or pressure pulses are convergent having one or more geometric focal volumes or points located at a distance X, X being defined as the distance from an exit window to the one or more focal volumes or points from the generator or source, the erect penis being positioned at the distance X or less than the distance X from the exit window source.

14. The method of treating an appendage of a patient using acoustic shock waves of claim 1, further comprises lowering the temperature of the appendage being treated to change tissue impedance to improve tissue stimulation

DN0400PROV	63430795	08/30/2022	ENERGIZED BEVERAGE John F. Warlick

Status: provisional

A treatment for fluids or liquids, more particularly beverages. The treatment uses acoustic shock waves to impart a molecular change in the beverage.

1. A method of stimulating and energizing a fluid comprises the steps of:

activating an acoustic shock wave or pressure pulse generator to emit acoustic shock waves or pressure pulses directed to impinge the fluid; and

subjecting the fluid to the acoustic shock waves or pressure pulses to form a stimulated and energized fluid.

2. The method of claim 1, wherein the emitted acoustic shock waves or pressure pulses are of a low energy.

3. The method of claim 1, wherein the emitted shock waves or pressure pulses are convergent, divergent, planar or near planar.

4. The method of claim 1, wherein the emitted shock waves or pressure pulses stimulate the fluid in the absence of cavitation.

5. The method of claim 1, wherein the step of activating the acoustic shock wave generator or source emits low energy or unfocused acoustic shock waves, wherein the acoustic shock waves are waves having amplitudes above 0.1 MPa and rise times of the amplitude are below 100 nano-seconds with a duration of a shock wave being below 3 micro-seconds for the positive part of a cycle and wherein the pressure pulses are an acoustic pulse which includes several cycles of positive and negative pressure with amplitudes of the positive part of such a cycle being above 0.1 MPa and the pressure pulse time duration is from below a

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

microsecond to about a second, rise times of the positive part of the first pressure cycle is in the range of nano-seconds up to several milli-seconds.

6. A liquid beverage having a composition of stimulated energized fluid comprises:

a quantity of fluid; and

enhanced molecules treated with acoustic shock waves or pressure pulses dispersed in the quantity of fluid.

7. The liquid beverage of claim 6, wherein the quantity of fluid after being treated with the acoustic shock waves exhibits an increased entropy.

8. The liquid beverage of claim 6, wherein the enhanced molecules are stimulated to enhance absorption when consumed increasing the energy absorbed by a drinker.

9. The liquid beverage of claim 6, wherein the beverage is an alcoholic beverage.

10. The liquid beverage of claim 9, wherein the alcoholic beverage is a beer, wine or whiskey.

11. The liquid beverage of claim 10, wherein an alcohol percentage is increased after the acoustic shock wave treatment.

12. The liquid beverage of claim 6 wherein the beverage is a non-alcoholic energy booster drink.

13. The liquid beverage of claim 6 wherein the beverage is water.

DN0401	17949725	09/21/2022	ACOUSTIC SHOCK WAVE OR PRESSURE PULSE TREATMENT AND METHODS OF USE FOR BRAIN INFLAMMATION John F. Warlick

Status: 10/31/2022 ready for examination

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

A method of treating a traumatic brain injury to reduce pressure and inflammation using pressure pulses or shock waves having the steps of placing an applicator head of an acoustic shock wave or pressure pulse generator or source on a head near a swollen region at the brain injury; coupling the applicator head directly or indirectly to an exposed surface of the skin and head near the swollen region; and activating the generator or source to emit pressure pulses or acoustic shock waves through the skin and head to brain tissue exhibiting high pressure and inflammation to reduce the pressure and inflammation.

1. A method of treating a traumatic brain injury to reduce pressure and inflammation using pressure pulses or shock waves comprises the steps of:

placing an applicator head of an acoustic shock wave or pressure pulse generator or source on a head near a swollen region at the brain injury;

coupling the applicator head directly or indirectly to an exposed surface of the skin and head near the swollen region; and

activating the generator or source to emit pressure pulses or acoustic shock waves through the skin and head to brain tissue exhibiting high pressure and inflammation to reduce the pressure and inflammation.

2. The method of claim 1, wherein the emitted pressure pulses or acoustic shock waves are transmitted in a pattern passing through the head to the brain.

3. The method of claim 1, wherein the emitted pressure pulses or acoustic shock waves pattern impinges the brain prior through a boney structure of a cranium or skull.

4. The method of claim 1, wherein the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure.

5. The method of claim 4, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second.

6. The method of claim 5, wherein the rise times of the positive part of the first pressure cycle in the range of nanoseconds (ns) up to some milliseconds (ms).

7. The method of claim 6 wherein the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 1000 ns.

. The method of claim 3, wherein the duration of the shock wave is typically below 1-3 microseconds (μs) for the positive part of a cycle and typically above some microseconds for the negative part of a cycle.

9. The method of claim 3, wherein subjecting the brain to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the neuronal cells stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of hemorrhaging caused by the emitted waves or pulses in neuronal cells wherein the neuronal cells are positioned within a path of the emitted shock waves or pressure pulses; and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the neuronal cells or beyond the neuronal cells thereby passing the emitted waves or pulses through the neuronal cells while avoiding having any localized focal point within the neuronal cells of the brain.

10. The method of claim 1, wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm^2 to a high end of below 1.0 mJ/mm^2.

11. The method of claim 10, wherein subjecting the brain directly to the acoustic shock waves having a low energy density of less than 1.0 mJ/mm^2 per shock wave stimulates said neuronal cells or brain tissue wherein the neuronal cells or brain tissue is positioned directly within a path of the emitted pressure pulses or acoustic shock waves in the absence of any focal point or if a focal point exists, the neuronal cells or brain tissue being treated is positioned away from any focal point.

12. The method of claim 11, wherein the energy density is selected to avoid any cell damage to the neuronal cells or brain tissue.

13. The method of claim 1, wherein treating the brain to stimulate by accelerating or increasing neuronal cell growth or regeneration wherein the administering is applied to a patient who has a pathological condition of the brain exhibiting damage caused by injury or disease such as diabetes, brain damage associated with stroke, and for the treatment of neurological disorders related to neurodegeneration, including Parkinson's disease, Alzheimer's disease and amyotrophic lateral sclerosis, multiple sclerosis and disseminated sclerosis, and for the treatment of bipolar disorder, depression, and schizophrenia any one of which has caused an increased pressure and inflammation which is reduced by the treatment.

14. The method of treating the brain of claim 1 stimulates by accelerating and increasing neuronal cell neurological brain tissue growth or regeneration or repair in addition to reducing brain tissue swelling and pressure and inflammation and wherein the neuronal cell or neurological brain tissue is from a mammal which is a human or an animal.

DN0402	17964451	10/12/2022	ACOUSTIC SHOCK WAVE OR PRESSURE PULSE TREATMENT AND METHODS OF USE FOR ANTI-AGING John F. Warlick

Status: 11/18/2022 ready for examination

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

A method of treating a reflexology zone to reduce aging using pressure pulses or shock waves has the steps of: placing an applicator head of an acoustic shock wave or pressure pulse generator or source at a reflexology zone; coupling the applicator head directly or indirectly to an exposed surface of the skin near the reflexology zone; and activating the generator or source to emit pressure pulses or acoustic shock waves through the skin to the reflexology zone to reduce, reverse or stop cell senescence or aging and apoptosis.

1. A method of treating a reflexology zone to reduce aging using pressure pulses or shock waves comprises the steps of:

placing an applicator head of an acoustic shock wave or pressure pulse generator or source at a reflexology zone;

coupling the applicator head directly or indirectly to an exposed surface of the skin near the reflexology zone; and

activating the generator or source to emit pressure pulses or acoustic shock waves through the skin to the reflexology zone to reduce, reverse or stop cell senescence or aging and apoptosis.

2. The method of claim 1, wherein the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure.

3. The method of claim 2, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second.

4. The method of claim 3, wherein the rise times of the positive part of the first pressure cycle in the range of nanoseconds (ns) up to some milliseconds (ms).

5. The method of claim 4, wherein the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 1000 ns.

6. The method of claim 3, wherein the duration of the shock wave is typically below 1-3 microseconds (μs) for the positive part of a cycle and typically above some microseconds for the negative part of a cycle.

7. The method of claim 1, wherein subjecting the reflexology zone to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the reflexology zone stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of hemorrhaging caused by the emitted waves or pulses in cells wherein the cells are positioned within a path of the emitted shock waves or pressure pulses; and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the skin or beyond the skin thereby passing the emitted waves or pulses through the skin while avoiding having any localized focal point within the skin, wherein shortened telomeres at ends of chromosomes are lengthened, thereby regenerating the telomeres reversing senescence in cells.

8. The method of claim 1, wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm^2 to a high end of below 1.0 mJ/mm^2.

9. The method of claim 8, wherein subjecting the cells directly to the acoustic shock waves having a low energy density of less than 1.0 mJ/mm^2 per shock wave stimulates said reflexology zone wherein the reflexology zone is positioned directly within a path of the emitted pressure pulses or acoustic shock waves in the absence of any focal point or if a focal point exists, the reflexology zone being treated is positioned away from any focal point.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

10. The method of claim 1, wherein the frequency of the emitted pressure pulses or shock waves is in the range of .5 Hz to 15 MHz.

11. The method of claim 10, wherein the frequency of the emitted pressure pulses or shock waves has a preferred range of 70 Hz to 150 Hz.

12. The method of claim 1, wherein treating the reflexology zone stimulates by accelerating and increasing cell growth or regeneration or repair.

13. The method of claim 1, wherein the acoustic shock waves or pressure pulses are directed to one or more reflexology zones of the hands, feet or ears to cause a positive biologic response to treat the cells.

14. The method of claim 13, wherein the acoustic shock waves or pressure pulses are directed to an entire surface of one or both hands or feet or ears.

15. The method of claim 14, wherein the shock wave or pressure pulse generator is acoustically coupled to the patient's skin using a coupling gel or liquid.

16. The method of claim 13, wherein the positive biologic response reduces or eliminates systemic or local inflammation and reverses senescence in cells.

17. The method of claim 13, wherein the positive biologic response initiates, activates or recruits cells reversing senescence.

18. The method of claim 17, wherein stimulating the one or more reflexology zones or the one or more reflexology zones and the cells causes a stimulation or modulation of adrenergic receptors α and β and one or more of a release of nitric oxide, secretion of digestive enzymes, inflammation reduction, hormonal regulation and peptide recruitment and activation.

19. The method of claim 18, wherein the stimulating the one or more reflexology zones or the one or more reflexology zones and the cells causes a release of growth factors including, but not limited to VEGF.

20. The method of claim 18, wherein the stimulating the one or more reflexology zones or the one or more reflexology zones and the cells causes new blood vessels to be created increasing vascularization and reversing senescence.

21. The method of claim 13 is repeated one or more times to treat and reverse the senescence condition.

22. The method of claim 13, wherein the emitted acoustic shock waves or pressure pulses are low energy soft waves.

23. The method of claim 22, wherein the low energy soft waves have an energy density in the range of 0.01 mJ/mm^2 to 1.0 mJ/mm^2.

24. The method of claim 13, wherein each subjected reflexology zone receives between 100 and 100,000 acoustic shock waves or pressure pulses per therapy session.

25. The method of claim 21, wherein the number of repeated treatments occur on a schedule over a period of one or more weeks, and treatments can be repeated over time as an anti-aging protocol over longer durations of time between repeated treatments.

26. A method of stimulating a cellular substance wherein the cellular substance is a patient having senescent cells or a culture of

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

senescent cells comprises the steps of:

treating the cellular substance;

activating an acoustic shock wave generator or source to emit pressure pulses or acoustic shock waves directed toward the substance to impinge the substance with pressure pulses or shock waves having a low energy density in the range of 0.00001 mJ/mm ^{2} to 1.0 mJ/mm ^{2}; the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second, rise times of the positive part of the first pressure cycle in the range of nano-seconds (ns) up to some milli-seconds (ms), the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 100's of ns, the duration of the shock wave is typically below 1-3 micro-seconds (μs) for the positive part of a cycle and typically above some micro-seconds for the negative part of a cycle; and

subjecting the cellular substance to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the substance stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of cellular hemorrhaging caused by the emitted waves or pulses in the substance wherein the cellular substance is positioned within a path of the emitted shock waves or pressure pulses and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cellular substance or beyond the cellular substance thereby passing the emitted waves through the cellular substance while avoiding having any localized focal point within the cellular substance wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm^2 to a high end of below 1.0 mJ/mm^2.

27. The method of claim 26, wherein the shock waves stimulate the senescent cells enhancing replication.

DN0405	18102243	01/27/2023	ACOUSTIC SHOCK WAVE OR PRESSURE PULSE TREATMENT FOR PROPTOSIS OR EXOPHTHALMOS John F. Warlick

Status: 03/08/2023 ready for examination

The device of the present invention allows for a method of treating a patient exhibiting proptosis of eye tissue by treating inflamed tissue behind the eye or treating the thyroid directly or treating a reflexology zone to reduce pressure and inflammation of the eye tissue using pressure pulses or shock waves. The treatment method for bulging eyes has the steps of placing an applicator head of an acoustic shock wave or pressure pulse generator or source on or near an eye or eyelid region, temple, thyroid or reflexology zone; coupling the applicator head directly or indirectly to an exposed surface of the region being treated; and activating the generator or source to emit pressure pulses or acoustic shock waves to the eye or eyelid region, temple, thyroid or reflexology zone to treat the eye tissue exhibiting high pressure and inflammation to reduce the pressure and inflammation.

1. A method of treating a patient exhibiting proptosis of eye tissue to reduce pressure and inflammation using pressure pulses or

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

shock waves comprises the steps of:

placing an applicator head of an acoustic shock wave or pressure pulse generator or source near an eyelid or eye region of the patient;

coupling the applicator head directly or indirectly to an exposed surface of the skin near the eyelid or eye region; and

activating the generator or source to emit pressure pulses or acoustic shock waves to the eye tissue exhibiting high pressure and inflammation to reduce the high pressure and inflammation.

2. The method of claim 1, wherein the emitted pressure pulses or acoustic shock waves are transmitted in a pattern passing through the eyelid skin to the eye tissue.

3. The method of claim 1, wherein the emitted pressure pulses or acoustic shock waves pattern impinges the eye tissue.

4. The method of claim 1, wherein the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure.

5. The method of claim 4, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second.

6. The method of claim 5, wherein the rise times of the positive part of the first pressure cycle in the range of nanoseconds (ns) up to some milliseconds (ms).

7. The method of claim 6 wherein the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 1000 ns.

8. The method of claim 3, wherein the duration of the shock wave is typically below 1-3 microseconds (μs) for the positive part of a cycle and typically above some microseconds for the negative part of a cycle.

9. The method of claim 3, wherein subjecting the eye tissue to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the cells stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of hemorrhaging caused by the emitted waves or pulses in cells wherein the cells are positioned within a path of the emitted shock waves or pressure pulses; and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cells or beyond the cells thereby passing the emitted waves or pulses through the cells while avoiding having any localized focal point within the cells.

10. The method of claim 1, wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic wave generation having an energy density value ranging as low as 0.00001 mJ/mm^2 to a high end of below 1.0 mJ/mm^2.

11. The method of claim 10, wherein subjecting the eye tissue directly to the acoustic shock waves having a low energy density of less than 1.0 mJ/mm^2 per shock wave stimulates said cells or eye tissue wherein the cells or eye tissue is positioned directly within a path of the emitted pressure pulses or acoustic shock waves in the absence of any focal point or if a focal point exists, the cells or eye tissue being treated is positioned away from any focal point.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

12. The method of claim 11, wherein the energy density is selected to avoid any cell damage to the cells or eye tissue.

13. The method of claim 1, wherein treating the eye tissue to stimulate by accelerating or increasing cell growth or regeneration wherein the administering is applied to the patient who has a pathological condition of the eyes exhibiting damage caused by thyroid disease, injury or inflammation, any one of which has caused an increased pressure and inflammation which is reduced by the treatment.

14. The method of treating the eye tissue of claim 1 stimulates by accelerating and increasing cell tissue growth or regeneration or repair in addition to reducing eye tissue swelling and pressure and inflammation and wherein the cell or eye tissue is from a mammal which is a human or an animal.

15. A method of treating a patient exhibiting proptosis of eye tissue to reduce pressure and inflammation causing proptosis using pressure pulses or shock waves comprises the steps of:

placing an applicator head of an acoustic shock wave or pressure pulse generator or source near the temple of the patient;

coupling the applicator head directly or indirectly to an exposed surface of the skin near the temple; and

activating the generator or source to emit pressure pulses or acoustic shock waves to the eye tissue exhibiting high pressure and inflammation to reduce the high pressure and inflammation.

16. A method of treating a patient exhibiting proptosis of eye tissue to reduce pressure and inflammation causing proptosis using pressure pulses or shock waves comprises the steps of:

placing an applicator head of an acoustic shock wave or pressure pulse generator or source near the thyroid of the patient;

coupling the applicator head directly or indirectly to an exposed surface of the skin near the eyelid or eye region; and

activating the generator or source to emit pressure pulses or acoustic shock waves to the eye tissue exhibiting high pressure and inflammation to reduce the high pressure and inflammation.

17. A method of treating a patient exhibiting proptosis of eye tissue using a reflexology zone to reduce pressure and inflammation causing proptosis using pressure pulses or shock waves comprises the steps of:

placing an applicator head of an acoustic shock wave or pressure pulse generator or source near an eye or thyroid reflexology zone of the patient;

coupling the applicator head directly or indirectly to an exposed surface of the skin near the eye or thyroid reflexology zone; and

activating the generator or source to emit pressure pulses or acoustic shock waves to the eye or thyroid reflexology zone to treat the eye tissue exhibiting high pressure and inflammation to reduce the high pressure and inflammation.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
DN0406	18110073	02/15/2023	ACOUSTIC SHOCK WAVE OR PRESSURE PULSE TREATMENT FOR GUM SENSITIVITY John F. Warlick

Status: 03/22/2023 ready for examination

The device of the present invention allows for a method of treating a patient exhibiting sensitivity of gum tissue by treating gum tissue or treating a reflexology zone to reduce pain and inflammation of the gum tissue using pressure pulses or shock waves. The treatment method for gum sensitivity has the steps of placing an applicator head of an acoustic shock wave or pressure pulse generator or source on or near gum tissue or reflexology zone; coupling the applicator head directly or indirectly to an exposed surface of the region being treated; and activating the generator or source to emit pressure pulses or acoustic shock waves to the gum tissue or reflexology zone to treat the gum tissue exhibiting pain and inflammation to reduce the pain and inflammation. 1. A method of treatment for a sensitive gum tissue exhibiting a sensitivity to touch, heat or cold conditions in a diagnosed patient comprises the steps of:

activating an acoustic shock wave generator or source to emit acoustic shock waves; and

subjecting the sensitive gum tissue of the patient to the acoustic shock waves stimulating said gum tissue, wherein the gum tissue is positioned within a path of the emitted shock waves.

2. The method of treatment of claim 1, wherein the emitted shock waves are convergent, divergent, planar or near planar.

3. The method of treatment of claim 1, wherein the emitted shock waves are convergent having one or more geometric focal volumes of points at a distance of at least X from the generator or source, the method further comprising positioning the gum tissue at a distance at or less than the distance X from the source.

4. The method of treatment of claim 1 further comprises the step of:

administering one or more medicaments prior, during or after subjecting the patient to acoustic shock waves.

5. The method of treatment of claim 1 further comprises the step of:

testing the sensitivity of the treated gum tissue of the diagnosed patient before and after exposure to one or more acoustic shock wave treatments.

6. The method of treatment of claim 1 further comprises the step of:

numbing and desensitizing the gum tissue.

7. The method of treatment of claim 1, wherein the treated gum tissue has no indication of periodontal disease including any indication of one or more pathological conditions including:

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

a periodontal biofilm mass, periapical endodontic lesions, endo-perio lesions, gingivitis, inflammation of gingival tissue, periodontitis, progressive loss of ligament, cementum or alveolar bone support to teeth.

8. The method of claim 6, wherein the treated gum tissue activates or otherwise stimulates stem cells or release of cellular growth factors in the oral structure effecting a tissue repair or tissue regeneration.

9. A method of treating a patient exhibiting sensitivity of gum tissue to reduce pain and inflammation using pressure pulses or shock waves comprises the steps of:

placing an applicator head of an acoustic shock wave or pressure pulse generator or source near the gum tissue of the patient;

coupling the applicator head directly or indirectly to an exposed surface of the skin near the gum tissue; and

activating the generator or source to emit pressure pulses or acoustic shock waves to the gum tissue exhibiting pain and inflammation to reduce the pain and inflammation.

10. The method of claim 9, wherein the emitted pressure pulses or acoustic shock waves are transmitted in a pattern passing through the gum tissue.

11. The method of claim 9, wherein the emitted pressure pulses or acoustic shock waves pattern impinges the gum tissue.

12. The method of claim 9, wherein the pressure pulse being an acoustic pulse which includes several cycles of positive and negative pressure.

13. The method of claim 12, wherein the pressure pulse has an amplitude of the positive part of such a cycle should be above 0.1 MPa and the time duration of the pressure pulse is from below a microsecond to about a second.

14. The method of claim 13, wherein the rise times of the positive part of the first pressure cycle is in the range of nanoseconds (ns) up to some milliseconds (ms).

15. The method of claim 14, wherein the acoustic shock waves being very fast pressure pulses having amplitudes above 0.1 MPa and rise times of the amplitude being below 1000 ns.

16. The method of claim 11, wherein the duration of the shock wave is typically below 1-3 microseconds (μs) for the positive part of a cycle and typically above some microseconds for the negative part of a cycle.

17. The method of claim 11, wherein subjecting the gum tissue to convergent, divergent, planar or near planar acoustic shock waves or pressure pulses in the absence of a focal point impinging the cells stimulating a cellular response in the absence of creating cavitation bubbles evidenced by not experiencing the sensation of hemorrhaging caused by the emitted waves or pulses in cells wherein the cells are positioned within a path of the emitted shock waves or pressure pulses; and away from any localized geometric focal volume or point of the emitted shock waves wherein the emitted shock waves or pressure pulses either have no geometric focal volume or point or have a focal volume or point ahead of the cells or beyond the cells thereby passing the emitted waves or pulses through the cells while avoiding having any localized focal point within the cells.

18. The method of claim 1, wherein the emitted pressure pulses or shock waves are convergent, divergent, planar or near planar and the pressure pulse shock wave generator or source is based on electro-hydraulic, electromagnetic, piezoceramic or ballistic

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title

wave generation having an energy density value ranging as low as 0.00001 mJ/mm^2 to a high end of below 1.0 mJ/mm^2.

19. The method of claim 18, wherein subjecting the gum tissue directly to the acoustic shock waves having a low energy density of less than 1.0 mJ/mm^2 per shock wave stimulates said cells or gum tissue wherein the cells or gum tissue is positioned directly within a path of the emitted pressure pulses or acoustic shock waves in the absence of any focal point or if a focal point exists, the cells or gum tissue being treated is positioned away from any focal point.

20. The method of claim 19, wherein the energy density is selected to avoid any cell damage to the cells or gum tissue.

21. The method of claim 9, wherein treating the gum tissue to stimulate by accelerating or increasing cell growth or regeneration wherein the administering is applied to the patient who has a pathological condition of the gums exhibiting damage caused by gum disease, injury or inflammation, any one of which has caused pain and inflammation which is reduced by the treatment.

22. The method of treating the gum tissue of claim 9 stimulates by accelerating and increasing cell tissue growth or regeneration or repair in addition to reducing gum tissue swelling and pressure and inflammation in the absence of any pathological condition and wherein the cell or gum tissue is from a mammal which is a human or an animal.

23. A method of treating a patient exhibiting sensitivity of gum tissue to reduce pain and inflammation using pressure pulses or shock waves comprises the steps of:

placing an applicator head of an acoustic shock wave or pressure pulse generator or source near the cheek of the patient;

coupling the applicator head directly or indirectly to an exposed surface of the skin near the cheek; and

activating the generator or source to emit pressure pulses or acoustic shock waves to the gum tissue exhibiting pain and inflammation to reduce the pain and inflammation.

24. A method of treating a patient exhibiting sensitivity of gum tissue using a reflexology zone to reduce pressure and inflammation causing proptosis using pressure pulses or shock waves comprises the steps of:

placing an applicator head of an acoustic shock wave or pressure pulse generator or source near a gum or mouth reflexology zone of the patient;

coupling the applicator head directly or indirectly to an exposed surface of the skin near the gum or mouth reflexology zone; and

activating the generator or source to emit pressure pulses or acoustic shock waves to the gum or mouth reflexology zone to treat the gum tissue exhibiting pain and inflammation to reduce the pain and inflammation.

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
Axel Voss D31458US	11/654,805	01/18/2007	Device for Generating Shock Waves
Publication Date: 10/11/2007 Patent Issue Date: 04/13/2010		Publication No. US 2007/0239084 A1 Patent No. US 7,695,443 Maint Fee: all paid	

Assignment to Tissue Regeneration Technologies, Inc.

The invention relates to a device for generating shock waves for medical therapy comprising two electrodes of a spark discharge section, wherein the device is filled with a liquid medium, and wherein the liquid medium comprises a colloidal suspension of a conducting, semiconducting, or polarizable substance in water.

1. A therapy head for treatment with shock waves into which is inserted device (V) for generating acoustic shock waves for medical therapy when an applied voltage of 10 KV to about 30 KV is applied to generate a spark discharge the therapy head comprising
a housing having a reflector (R) which is formed having a cavity that has an open side in the distal direction;
a closure cap (D) made from a material for coupling the shock waves into the body part to be treated, the closure cap (D) closes the open side of the reflector sealing the cavity; and wherein
the device (V) is inserted into a recess on a proximal side of the housing, the device (V) having two electrodes of a spark discharge section extending into the cavity, which generates a spark discharge under exposure to 10 KV to 30 KV at on or near a focus of the reflector wherein the cavity is filled with a liquid medium, and wherein the liquid medium comprises a colloidal particle suspension of a conducting, semiconducting, or polarizable substance of aluminum particles in water which reduces the latency time of the shock wave generation wherein the aluminum particles are of a size of 1 nanometer to 1 micron to prevent falling of the particles in a gravitational field thereby maintaining a portion of the colloidal particle suspension between the two electrodes.

2. The device according to claim 1, wherein the diameter of the particles of the conducting, semiconducting, or polarizable substance of particles is smaller than 1 micron.

Axel Voss D31464US	11/699,863	01/30/2007	Device For The Generation Of Shock Waves Utilizing A Thyristor

TRT USPTO Patent Filings

Docket Number	USPTO Serial Number	Filing Date (day/month/year)	Title
Publication Date: 10/04/2007 Granted: 08/17/2010		Publication No. US 2007/0232964 A1 Patent No. 7,775,995 Maint Fee: 11.5 yr due 02/18/2022	

Assignment to Tissue Regeneration Technologies, Inc.

The invention relates to a device for the generation of shock waves for medical therapy, having a shock source, an energy storage and a switch, wherein the energy storage is a capacitor with a high capacity.

1. A device for the generation of shock waves for the medical therapy, having an electro-hydraulic shock source, an energy storage and a switch, wherein the energy storage is a capacitor with a capacitance of between 500 nF and larger than 100 nF and the switch is a semiconductor MOSFET thyristor switch, and the electro-hydraulic shock source is a spark discharge section and the spark discharge section having two essentially pointed electrodes whose tips are arranged at a distance of 0.1 mm to 1 mm from one another, which discharges when the capacitor is charged to a voltage of between 500 V to 5000 V.