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A Micro/Nanobubble Oxygenated Solutions for Wound Healing and Tissue Preservation

Tech ID: 27074 / UC Case 2017-063-0

CONTACT

Patricia H. Chan
patricia.chan@uci.edu
tel: 949-824-6821.



OTHER INFORMATION

CATEGORIZED AS

- » **Agriculture & Animal Science**
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 - » Delivery Systems
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 - » Disease: Autoimmune and Inflammation

BRIEF DESCRIPTION

Soft-tissue injuries and organ transplantation are common in modern combat scenarios. Organs and tissues harvested for transplantation need to be preserved during transport, which can be very difficult. Micro and nanobubbles (MNBs) offer a new technology that could supply oxygenation to such tissues prior to transplantation, thus affording better recovery and survival of patients. Described here is a novel device capable of producing MNB solutions that can be used to preserve viability and function of such organs/tissue. Additionally, these solutions may be used with negative pressure wound therapy to heal soft-tissue wounds.

FULL DESCRIPTION

Micro and nanobubbles (MNBs) provide a novel technology that is capable of delivering oxygen to wounds or tissue being harvested for transplant. These solutions can be applied to a variety of contexts, particularly in modern combat injuries (typically characterized by explosive wounds that can result in soft tissue defects with high risk of contamination and burns) and in the case of tissue/organ transplants. Currently, there generators for micro and nanobubbles are bulky and hard to translate into medical devices.

Researchers at UCI have developed a novel device that can generate MNBs. Their device and methods have been shown to generate MNCs that are stable for prolonged periods of time in many types of solutions. They have demonstrated that MNBs provide optimal oxygenation to tissues and have wound healing capabilities.

ADVANTAGES

- A distinct feature of this technology is the ability of the generated MNBs to be applied to almost all commonly used irrigation solutions, making them capable of providing oxygenation to tissue.
- Negative pressure wound therapy (NPWT) with instillation is a technique that has shown improved healing of extensive soft tissue wounds. This technology can be used in conjunction with NPWT to further promote healing in complicated wounds.
- MNB solutions have been implemented or suggested for various industries: water treatment, animal/plant biology, cancer treatments, wound healing; this device provides an accessible, less bulky way to generate stable MNBs that can be applied to all of these industries.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,023,410	07/02/2024	2017-063

STATE OF DEVELOPMENT

Prototype in finalization and testing phase

RELATED MATERIALS

- » Reduction of Accumulated Reactive Oxygen Species Can Be Achieved By Bathing Standard Lipoaspirate in Oxygenated Micro/Nanobubbles - 05/19/2016
- » Micro and Nanobubbles for Wound Healing Applications by Klopfer, Michael John, Ph.D., UNIVERSITY OF CALIFORNIA, IRVINE, 2015, 167 pages; 3709738 - 01/01/2015

- » Disease: Blood and Lymphatic System
- » Disease: Cancer

- » Disease: Cardiovascular and Circulatory System
- » Disease: Central Nervous System

- » Disease: Dental

- » Disease: Dermatology

- » Disease: Infectious Diseases

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