NON-THERMAL IRREVERSIBLE ELECTROPORATION AND IMMUNE SYSTEM ENABLED TISSUE ENGINEERING

Tech ID: 21043 / UC Case 2010-016-0

PATENT STATUS

<table>
<thead>
<tr>
<th>Country</th>
<th>Type</th>
<th>Number</th>
<th>Dated</th>
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<tr>
<td>United States Of America</td>
<td>Issued Patent</td>
<td>8,835,166</td>
<td>09/16/2014</td>
<td>2010-016</td>
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BRIEF DESCRIPTION

Treatment of disease and trauma to the coronary arteries and the peripheral vessels often includes the use of bypass grafting. Autologous grafts are most often used and are typically taken from the saphenous vein, internal mammary artery, or the radial artery; however, this method is not an option in patients without a vein that is suitable to use. Also, the costs for harvesting autologous vessels are considerable, and there is a significant level of morbidity associated with the procedure. Also, the use of synthetic grafts in small diameter vessels tends to lead to poor compliance and low patency, often resulting in thrombogenicity. Furthermore, although recent tissue engineering methods have focused on a variety of tissue decellularization methods, these methods risk damage to the extracellular membrane (ECM), which acts as a scaffold for tissue repair and regeneration, compromising the scaffold's further development and integration into the recipient's body.

UC Scientists have developed an alternative technology that does not have the disadvantages and shortcomings seen in both autologous and synthetic grafts. Such technology includes a method of treatment comprising subjecting a target area of tissue in a mammal to non-thermal irreversible electroporation (NTIRE) in order to kill cells at the target site without the use of any chemical agents, toxins, enzymes or use of physical devices beyond the NTIRE devices. After the immune system has removed cells killed with the NTIRE, and before there is substantial growth of new cells the tissue is removed from the mammal and transplanted to a repair site, all of which is carried out in the absence of any immunosuppressant drugs.

SUGGESTED USES

» Methods of treatment (e.g., tissue repair or regeneration)
» Non-thermal irreversible electroporation

ADVANTAGES

» Process can carry out the cell removal in the absence of any chemicals, toxins or enzymes typically used to in order to eliminate the cells.
» No need for immunosuppressant drugs
» Reduced risk of graft rejection
» ECM rich in cell signaling components essential for cell adhesion, migration, proliferation and differentiation
» ECM has a greater resistance to infection as compared to synthetic materials

PUBLICATION

Irreversible Electroporation on the Small Intestine

USER DEFINED 2

Nonthermal Irreversible Electroporation for Tissue Decellularization

CATEGORIZED AS

» Medical
» Devices
» Disease: Cardiovascular and Circulatory System
» Research Tools
» Other
» Sensors & Instrumentation
» Medical
» Veterinary
» Other

RELATED CASES

2010-016-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

» Device for monitoring and optimizing Electrolysis