

A Three Dimensional Matrix for Producing Living Tissue Equivalents

Background

Tissue or organ injury or loss due to disease or accident results in tremendous health care costs. Tissue injury such as burns, diabetic foot ulcers, and venous leg ulcers require immediate medical attention. However, treatment of these conditions is heavily limited by the availability of donor organs and tissues. Furthermore, the success of organ transplantation is often limited by tissue rejection and risk of disease transmission. An autologous tissue replacement, comprised of the patient's own cells, or an allogenic tissue replacement, may solve the problem of tissue and organ deficiency, but these strategies pose certain limitations that are yet to be overcome. Thus, tissue equivalents that are close to native human tissue in histological and functional properties would be desirable in treating tissue and organ injuries. **Thus, the present invention satisfies a long felt need for producing tissue equivalents that have utility in a wide variety of medical applications.**

Description of the Technology

UMDNJ researchers have developed a method for producing *de novo* a three-dimensional collagen matrix using human fibroblast cells for use as tissue equivalents. The matrix disclosed in the invention can be used to construct living tissue equivalents such as skin, blood vessel, bone tendon, ligaments and organ equivalents. For example, a three dimensional collagen matrix can be produced by including fibroblasts in a hemostatic clot mixture consisting of blood plasma and thrombin. The fibroblasts polymerize and cross link to produce an insoluble fibrin matrix permitting the fibroblast to proliferate and produce collagen. Furthermore, the characteristics of the matrix may be altered to suit and an individual's specific needs. For example, the tissue may be formed in any desired shape or size by embedding a scaffolding material. Other tissues can also be produced using the method disclosed in the invention.

Advantages

- . •Uses human cells only.
- . •Harnesses the body's own response to injury
- . •Greatly reduces the risk of transmission of disease.

Applications

- .• Research: -to test efficacy of investigational agents and
- .-to study disease mechanisms
- .-to test efficacy of treatment protocols-to culture cells such as keratinocytes, hepatocytes, bone marrow cells.
- . •Diagnostic assays
- . •Therapeutic applications: to replace lost or damaged tissues.

Patent Status

- . •United States application filed.

. •Application was published on 09/04/2003 (publication number: US-2003-0166274-A1)

Licensing Opportunity

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This technology will be licensed exclusively for diagnostic or therapeutic applications and non-exclusively for research applications.

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