Title: BIOENGINEERED TISSUE SUBSTITUTE

Abstract: In one aspect, the invention provides methods for forming a target tissue substitute. The methods of the invention comprise the following steps: (a) providing a scaffold comprising one or more layers of one or more arrays of microfibers, wherein one or more of the arrays of microfibers is designed to mimic the configuration of one or more structural elements in a target tissue; and (b) culturing cells on the scaffold to form a target tissue substitute. In another aspect, the invention provides implantable medical devices. The implantable medical devices of the invention comprise a scaffold comprising one or more layers of one or more arrays of microfibers, wherein one or more of the arrays of microfibers is arranged to mimic the configuration of one or more structural elements in a target tissue. Typically, cells are cultured on the scaffold to form a target tissue substitute.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

<table>
<thead>
<tr>
<th>IPC(7)</th>
<th>US CL</th>
</tr>
</thead>
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<tr>
<td>C12N 5/00, A61F 2/02, 2/04, 2/06, 2/08</td>
<td>424/422, 423, 426, 93.7; 623/1, 2, 11, 12, 14</td>
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S.: 424/422, 423, 426, 93.7; 623/1, 2, 11, 12, 14

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tbody>
<tr>
<td>A</td>
<td>US 4,549,545 A (LEVY) 29 October 1985 (29.10.1985), see the entire document.</td>
<td>1-73</td>
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<tr>
<td>A</td>
<td>US 5,290,721 A (JERNBERG) 01 March 1994 (01.03.1994), see the entire document.</td>
<td>1-73</td>
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</table>

Further documents are listed in the continuation of Box C.

See patent family annex.

Date of the actual completion of the international search: 10 December 2003

Date of mailing of the international search report: 22 January 2004

Name and mailing address of the ISA/US

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Authorized officer: Janet C. Witz
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Form PCT/ISA/210 (second sheet) (July 1998)
Continuation of B. FIELDS SEARCHED Item 3:
EAST, CAPLUS, DIALOG, MEDLINE, BIOSIS:
search terms: microfiber, implant, tissue, cells