Title: COMPOSITION FOR REGENERATING CONNECTIVE TISSUE, AND METHOD FOR REGENERATING CONNECTIVE TISSUE

Abstract: The present invention relates to a composition for regenerating connective tissue and to a method for regenerating connective tissue, and more particularly, to a composition for regenerating connective tissue and to a method for regenerating a connective tissue wherein the composition is formed by mixing hyaluronic acid and fibrinogen with acellocollagen or a myelocyte, and injected into the damaged portion of connective tissue, to thereby regenerate the connective tissue of the damaged portion. The composition for regenerating connective tissue according to the present invention may effectively regenerate a damaged portion of connective tissue, and specifically may exhibit activity in regenerating cartilage having a low regenerative capacity. Further, the composition of the present invention uses a natural material and therefore is harmless to the human body. The composition of the present invention may regenerate tissue-engineered cartilage that is similar to natural cartilage, and therefore may be valuably used as a therapeutic agent for cartilage which can effectively repair damaged cartilage tissue.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

A61K 31/55(2006.01)i, A61K 31/728(2006.01)i, A61P 7/02(2006.01)i, A61P 7/00(2006.01)i

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)
A61K 31/55; C12N 5/077; C12N 5/02; A61K 35/32; A61K 38/16

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

Electronic database consulted during the international search (name of database and, where practicable, search terms used)
eKOMPASS (KIPO internal) & Keywords: fibrinogen, hyaluronic acid, thrombin, connective tissue, recycling, atelocollagen, bone marrow, Aprotinin, Factor XIII, calcium chloride, cartilage

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>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>KR 10-2009-0013425 A (REGENPRIME CO., LTD.) 05 February 2009 See abstract; claims 20, 25-28, 30-33.</td>
<td>1-8,14</td>
</tr>
<tr>
<td>A</td>
<td>KR 10-2005-0064068 A (CELLONTECH CO., LTD.) 29 June 2005 See abstract; claims 1, 3, 4, 6 and 7.</td>
<td>1-8,14</td>
</tr>
<tr>
<td>A</td>
<td>KR 10-2007-0010990 A (SEWONCELLONTEC CO., LTD.) 24 January 2007 See abstract; claims 1, 2 and 4.</td>
<td>1-8,14</td>
</tr>
</tbody>
</table>

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
  “A” document defining the general state of the art which is not considered to be of particular relevance
  “E” earlier application or patent but published on or after the international filing date
  “L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  “O” document referring to an oral disclosure, use, exhibition or other means
  “P” document published prior to the international filing date but later than the priority date claimed

“I” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, each combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

30 NOVEMBER 2012 (30.11.2012)

Date of mailing of the international search report

30 NOVEMBER 2012 (30.11.2012)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonja-ro, Daejeon 302-701, Republic of Korea
Facsimile No. 82-42-472-7140

Authorized officer
Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)
**Box No. II**  Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. **☒** Claims Nos.: **9-13**
   because they relate to subject matter not required to be searched by this Authority, namely:

   Claims 9-13 pertain to a method for treatment of the human body by medicines, and thus pertain to subject matter on which the International Searching Authority is not required to carry out an international search under the provisions of PCT Article 17(2)(a)(i) and PCT Rule 39.1(iv).

2. **☐** Claims Nos.:
   because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. **☐** Claims Nos.:
   because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. III**  Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. **☐** As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. **☐** As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. **☐** As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. **☐** No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

- **☐** The additional search fees were accompanied by the applicant’s protest and, where applicable, the payment of a protest fee.
- **☐** The additional search fees were accompanied by the applicant’s protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- **☐** No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (July 2009)
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td>KR 10-2005-0064068 A</td>
<td>29.06.2005</td>
<td>CN 1897964 A</td>
<td>17.01.2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1706132 A1</td>
<td>04.10.2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1706132 B1</td>
<td>23.03.2011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 2007-513730 A</td>
<td>31.05.2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 4542106 B2</td>
<td>08.09.2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1912661 B1</td>
<td>16.03.2011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 2009-501605 A</td>
<td>22.01.2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2009-0254065 A1</td>
<td>08.10.2009</td>
</tr>
</tbody>
</table>

Form PCT/ISA/210 (patent family annex) (July 2009)
A. 발명이 속하는 기술분야(국제특허분야(IPC))

A61K 31/55(2006.01)i, A61K 31/728(2006.01)i, A61P 7/02(2006.01)i, A61P 7/00(2006.01)i

B. 조사된 문헌

조사된 최소문헌(국제특허문헌을 기재)
A61K 31/55; C12N 5/077; C12N 5/02; A61K 35/32; A61K 38/16

조사된 기술분야에 속하는 최소문헌 이외의 문헌

국제조사에 이용된 전산 데이터베이스(데이터베이스의 명칭 및 검색어(해당하는 경우))
eKOMPASS(목록형 내부 검색시스템) & 키워드: 피브리노겐, 피하혈관, 트롬본, 혈관결합, 혈스, 아포로티닌, Factor XIII, 염화갈슘, 유ancock

C. 관련 문헌

<table>
<thead>
<tr>
<th>카테고리</th>
<th>인용문헌명 및 관련 구절(해당하는 경우)의 기재</th>
<th>관련 청구항</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>KR 10-2005-0064068 A (주식회사 샬론텍) 2005.06.29. 요약: 청구항 1, 3, 4, 6 및 7 참조.</td>
<td>1-8.14</td>
</tr>
</tbody>
</table>

[추가 문헌이 C(계속)에 기재되어 있습니다. ❌ 대응특허에 관한 별지를 참조하십시오.]

* 인용된 문헌의 별표 카테고리:
  “A” 특별히 관련이 없는 것으로 보이는 일반적인 기술수준을 정의한 문헌
  “E” 국제특허원본에 따른 원출원 또는 우선일 또는 우선일을 가지거나 국제출원일 이후에 공개된 출원원 또는 특허 문헌
  “L” 우선권 주주에게 의문을 제기하는 문헌 또는 다른 인용문헌의 공개일 또는 다른 특별한 이슈(예: 발명)을 밝히기 위하여 인용된 문헌
  “O” 구체적, 사용, 결과 또는 기타 수단을 언급하고 있는 문헌
  “P” 우선일 이후에 공개되었거나 국제출원일 이전에 공개된 문헌

국제조사의 실적 완료일
2012년 11월 30일 (30.11.2012)

국제조사보고서 발송일
2012년 11월 30일 (30.11.2012)

IS/AKR의 명칭 및 주소
대한민국 특허청
(302-701) 대전광역시 서구 정자로 189, 4동 (문산동, 정부대전청사)
전화번호 82-42-472-7140

서식 PCT/ISA/210 (두 번째 용지) (2009년 7월)
제2기재란 일부 청구항을 조사할 수 없는 경우의 의견(첫 번째 용지의 2의 계속)

PCT 제17조(2)(a)의 규정에 따라 다음과 같은 이유로 일부 청구항에 대하여 본 국제조사보고서가 작성되지 아니하였습니다.

1. [x] 청구항: 9-13
   이 청구항은 본 기관이 조사할 필요가 없는 대상에 관련됩니다. 즉,


2. [ ] 청구항:
   이 청구항은 유효한 국제조사를 수행할 수 없을 정도로 소정의 요건을 충족하지 아니하는 국제출원의 부분과 관련됩니다.
   구체적으로는,

3. [ ] 청구항:
   이 청구항은 종속청구항이나 PCT규칙 6.4(a)의 두 번째 및 세 번째 문장의 규정에 따라 작성되어 있지 않습니다.

제3기재란 발명의 단일성이 결여된 경우의 의견(첫 번째 용지의 3의 계속)

본 국제조사기관은 본 국제출원에 다음과 같이 다수의 발명이 있다고 볼니다.

1. [ ] 출원인이 모든 추가수료를 기간 내에 납부하였으므로, 본 국제조사보고서는 모든 조사 가능환 청구항을 대상으로 합니다.

2. [ ] 추가수료 납부를 요구하지 않고도 모든 조사 가능환 청구항을 조사할 수 있었으므로, 본 기관은 추가수료 납부를 요구하지 아니하였습니다.

3. [ ] 출원인이 추가수료의 일부만을 기간 내에 납부하였으므로, 본 국제조사보고서는 수수료가 납부된 청구항만을 대상으로 합니다. 구체적인 청구항은 아래와 같습니다.

4. [ ] 출원인이 기간 내에 추가수료를 납부하지 아니하였습니다. 따라서 본 국제조사보고서는 청구범위에 처음 기재된 발명에 한정되어 있으며, 해당 청구항은 아래와 같습니다.

이의신청에 관한 기재

☐ 출원인의 이의신청 및 이의신청료 납부(해당하는 경우)와 함께 추가수료가 납부되었습니다.
☐ 출원인의 이의신청과 함께 추가수료가 납부되었으나 이의신청료 보정규칙에 명시된 기간 내에 납부되지 아니하였습니다.
☐ 이의신청 없이 추가수료가 납부되었습니다.

서식 PCT/ISA/210 (첫 번째 용지의 계속(2))(2009년 7월)
<table>
<thead>
<tr>
<th>국제조사보고서에서 인용된 특허문헌</th>
<th>공개일</th>
<th>대응특허문헌</th>
<th>공개일</th>
</tr>
</thead>
<tbody>
<tr>
<td>KR 10-2005-0064068 A</td>
<td>2005.06.29</td>
<td>CN 1897964 A</td>
<td>2007.01.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1706132 A1</td>
<td>2006.10.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1706132 B1</td>
<td>2011.03.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 2007-513730 A</td>
<td>2007.05.31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 4542106 B2</td>
<td>2010.09.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1912661 A1</td>
<td>2008.04.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1912661 B1</td>
<td>2011.03.16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 2009-501605 A</td>
<td>2009.01.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2009-0254065 A1</td>
<td>2009.10.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 2007-011094 A1</td>
<td>2007.01.25</td>
</tr>
</tbody>
</table>