Abstract: The present invention provides methods and compositions for treating inflammatory bowel disease, including ulcerative colitis and Crohn's Disease, and other related conditions, by locally administering to the intestinal mucosa of a subject having inflammatory bowel disease a therapeutically effective amount of IL-27 or a therapeutic variant or fragment thereof. The invention further provides a method to treat inflammatory bowel disease comprising administering to the subject a recombinant microorganism capable of producing a therapeutically effective amount of IL-27 or a variant or fragment thereof in situ in the intestinal mucosa.
Published: (88) Date of publication of the international search report: 15 March 2012

— with international search report (Art. 21(3))
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K38/20 A61K9/20 A61K47/30 A61K9/00 A61P1/00 A61P29/00
ADD.
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 A61P

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 practical, search terms used)
EPO-Internal, EMBASE, BIOSIS, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<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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</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 document published on or after the international filing date
  * "L" later document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another document, 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

* "T" 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 to be a novelty 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 taken together with one or more documents cited in the same field of technology

* "A" document member of the same patent family

Date of the actual completion of the international search: 24 October 2011
Date of mailing of the international search report: 30/01/2012

Name and mailing address of the ISA:
European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016

Authorized officer:
Escolar Blasco, P
<table>
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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<td>Y</td>
<td>BAHEY-EL-DIN MOHAMMED ET AL: &quot;Lactococcus lactis as a Cell Factory for Delivery of Therapeutic Proteins&quot;, CURRENT GENE THERAPY, vol. 10, no. 1, February 2010 (2010-02), pages 34-45, XP009153380, ISSN: 1566-5232 page 38 - page 39; table 1</td>
<td>2-11, 27, 45-50, 55, 56, 60</td>
</tr>
</tbody>
</table>
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.: because they relate to subject matter not required to be searched by this Authority, namely:

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).

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

- see additional sheet

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 an 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.:

   I-19 (completely); 27, 29, 30, 45-50, 55-60 (partially)

**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.
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-19 (completely) ; 27, 29, 30, 45-50, 55-60 (partially)
   local administration of IL-27 in the treatment of inflammatory bowel disease and other inflammatory pathologies
   ---

2. claims: 20-26, 28, 31-42 (completely) ; 27, 29, 30, 45-50, 55-62 (partially)
   recombinant microorganisms capable of producing IL-27 for use in therapy (in the treatment of conditions 'sensitive to IL-27')
   ---

3. claims: 43, 44, 51-54 (completely) ; 55, 56 (partially)
   A coated microparticle comprising IL-27 suitable for controlled release in the GI tract
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