(54) Title: AGONISTS OF GUANYLATE CYCLASE USEFUL FOR THE TREATMENT OF GASTROINTESTINAL DISORDERS, INFLAMMATION, CANCER AND OTHER DISORDERS

(57) Abstract: The invention provides novel guanylate cyclase-C agonist peptides and their use in the treatment of human diseases including gastrointestinal disorders, inflammation or cancer (e.g., a gastrointestinal cancer). The peptides can be administered either alone or in combination with an inhibitor of cGMP-dependent phosphodiesterase. The gastrointestinal disorder may be classified as either irritable bowel syndrome, constipation, or excessive acidity etc. The gastrointestinal disease may be classified as either inflammatory bowel disease or other GI condition, including Crohn’s disease and ulcerative colitis, and cancer.
before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
A. CLASSIFICATION OF SUBJECT MATTER

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)
C07K  A61K

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, CHEM ABS Data, Sequence Search, WPI Data, EMBASE, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<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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<tr>
<td>X</td>
<td>WO 02/078683 A (SYNERGY PHARMACEUTICALS INC [US]) 10 October 2002 (2002-10-10)</td>
<td>1, 2, 9, 10, 12-17, 19-21</td>
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<td>A</td>
<td>the whole document</td>
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Further documents are listed in the continuation of Box C.

Date of the actual completion of the International search
22 December 2008

Date of mailing of the International search report
13/01/2009

Name and mailing address of the ISA/
European Patent Office, P.B. 5518 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax (+31-70) 340-3916

Authorized officer
Wianne, Ilse
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<td>X</td>
<td>WO 2006/086653 A (MICROBIA INC [US]; CURRIE MARK G [US]; MAHAJAN-MIKLOS SHALINA [US]; SU) 17 August 2006 (2006-08-17) abstract</td>
<td>1, 2, 9, 10, 12-15, 17</td>
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<td>A</td>
<td>page 31, line 19 - line 20&lt;br&gt;page 32, line 5&lt;br&gt;page 19, line 8 - line 12&lt;br&gt;page 20, line 13 - line 14&lt;br&gt;page 22, line 18 - line 19&lt;br&gt;page 23, lines 5, 6, 21, 22</td>
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<td>WO 2007/022531 A (MICROBIA INC [US]; CURRIE MARK G [US]; MAHAJAN-MIKLOS SHALINA [US]; FR) 22 February 2007 (2007-02-22) abstract; examples 6, 7; sequences 3, 6 page 38, lines 3, 16, 18&lt;br&gt;page 37, line 28&lt;br&gt;page 13, line 7 - line 10&lt;br&gt;page 15, line 28 - line 29&lt;br&gt;page 16, line 17 - line 22&lt;br&gt;page 17, line 10 - line 11&lt;br&gt;page 19, line 16 - line 21</td>
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<td>HAMMAN JOSIAS H ET AL: &quot;Oral delivery of peptide drugs - Barriers and developments&quot; BIODRUGS, AUCKLAND, NZ, vol. 19, no. 3, 1 January 2005 (2005-01-01), pages 165-177, XP009095961 ISSN: 1173-8804 page 169, column 2, line 5 - last line</td>
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INTERNATIONAL SEARCH REPORT

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.: 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).

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:

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.:

   1-4, 9-21 (all partially for inventions 1, 7 and 56)

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

X 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:

Invention 1: claims 1,2,9,10,12-17,19-21 (all partially)

Peptide of SEQ ID NO:2 and use thereof.

Inventions 2-6: claims 1-21 (all partially and insofar as applicable)

Peptide and use thereof,
wherein the peptide is SEQ ID NO:x+1 for invention x; and
wherein x is from 2 to 6.

Invention 7: claims 1-4,9-21 (all partially)

Peptides of SEQ ID NO:8 or 9 and use thereof.

Inventions 8-52: claims 1-21 (all partially and insofar as applicable)

Peptide and use thereof,
wherein the peptide is SEQ ID NO:x+2 for invention x; and
wherein x is from 8 to 52.

Inventions 53-55: claims 1-21 (all partially and insofar as applicable)

Peptide and use thereof,
wherein the peptide is SEQ ID NO:x+3 for invention x; and
wherein x is from 53 to 55.

Invention 56: claims 1-4,9-21 (all partially)

Peptide of SEQ ID NO:59 and use thereof.

Inventions 57-95: claims 1-21 (all partially and insofar as applicable)

Peptide and use thereof,
wherein the peptide is SEQ ID NO:x+3 for invention x; and
wherein x is from 57 to 95.
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<td>CN 1551760 A</td>
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<td>17-08-2006</td>
<td>CA 2596505 A1</td>
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