Abstract:

A61K 31/7042 (2006.01) A61K 31/4015 (2006.01) A61P 35/00 (2006.01)

Such prodrug conjugates are activated by caspase, and methods using such prodrug conjugates to induce apoptosis, amplify apoptosis, and treat cancer.


Published:

— 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))
— with sequence listing part of description (Rule 5.2(a))
A. CLASSIFICATION OF SUBJECT MATTER

C07D 309/10(2006.01)i, A61K 47/48(2006.01)i, A61K 31/4015(2006.01)i, A61K 38/08(2006.01)i, A61K 31/7042(2006.01)i, A61P 35/00(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)
C07D 309/10; A61K 39/395; A61K 50/06; A61K 41/00; A61K 47/48; A61K 31/4015; A61K 38/08; A61K 31/7042; A61P 35/00

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

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS/kiPO internal, STNiRegistry, CApplus), Google & keywords: KGDEVD, doxorubicin, maleimide, PABC, a caspase-cleavable peptide, linker, conjugate

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>Y</td>
<td>US 2013-0338422 Al (RYU, JU-HEE et al.) 19 December 2013 See abstract ; paragraphs [0061] , [0068] [0098] ; claims 1-6; and figure 10b.</td>
<td>1-19</td>
</tr>
<tr>
<td>Y</td>
<td>RYPPA, CLAUDIA et al., &quot;In vitro and in vivo evaluation of doxorubicin conjugates with the divalent peptide E-(cRGDFK)2 that target s integrin at v β 3,&quot; Biocromat Graphy, 2008, vol. 19, no. 7, pp. 1414-1422 See abstract ; derivat 2; figure 2; and schemes 1, 2.</td>
<td>1-16, 18, 19</td>
</tr>
<tr>
<td>Y</td>
<td>CARLSON, COREY B. et al., &quot;Sel lective tumor cell targer ing using low-aff ini ty, multivalent interact ions,&quot; ACS Chemical Biology, 2007, vol. 2, no. 2, pp. 119-127 See abstract ; page 120, right column, lines 19-24 , page 122, right column, lines 8-15 ; and figure 2.</td>
<td>17-19</td>
</tr>
<tr>
<td>A</td>
<td>AAJ, [K][ALD]ADU et al., &quot;In vitro and in vivo study of a albumin-binding prodrug of doxorubicin that is cleaved by cathepsins in B,&quot; Cancer Chemoth erapy and Pharmacology, 2009, vol. 64, pp. 413-418 See abstract ; and figure 1.</td>
<td>1-19</td>
</tr>
</tbody>
</table>

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"B" earlier document 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

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 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, such combination being obvious to a person skilled in the art

* and ** document member of the same patent family

Date of the actual completion of the international search
29 June 2016 (29/06/2016)

Date of mailing of the international search report
29 June 2016 (29/06/2016)

Name and mailing address of the ISA/KR
International Application Division
Korean Intellectual Property Office
189 Cheongna-ro, Seo-gu, Daejeon, 35208, Republic of Korea

Facsimile No. +82-42-481-8578

Authorized officer
CHO, Han Sol

Telephone No. +82-42-481-5580

Form PCT/ISA/210 (second sheet) (January 2015)
**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. **X** Claims Nos.: 20-53
   because they relate to subject matter not required to be searched by this Authority, namely:
   The subject matter of claims 20-53 pertains to a method for treating a human body, and thus relate to a subject matter not required to search under PCT Article 17(2)(a)(i) and Rule 39.1(iv).

2. **X** Claims Nos.: 33-39, 41-45, 47-53
   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:
   Claims 33-39, 41-45, 47-53 refer to the multiple dependent claims which do not comply with PCT Rule 6.4(a).

3. **X** Claims Nos.: 32, 40, 46
   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. **X** As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

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

3. **X** 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. **X** 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.
- **X** 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.
- **X** No protest accompanied the payment of additional search fees.

Form PCT/ISA/2 10 (continuation of first sheet (2)) (January 2015)
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member(s)</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>KR 10-2015-0135796 A</td>
<td>03/12/2015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>¥0 2012-118237 Al</td>
<td>07/09/2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AU 783679 B2</td>
<td>24/11/2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BR 0108930 A</td>
<td>10/12/2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CA 2399255 Al</td>
<td>30/08/2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CN 100406137 A</td>
<td>26/03/2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HU 0300024 A2</td>
<td>28/05/2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 2003-523407 A</td>
<td>05/08/2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MX PA02007939 A</td>
<td>10/02/2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NZ 520458 A</td>
<td>25/02/2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>¥0 01-62300 A2</td>
<td>30/08/2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>¥0 01-62300 A3</td>
<td>25/04/2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ZA 200206105 A</td>
<td>31/07/2003</td>
</tr>
</tbody>
</table>