Title: RADIOMITIGATING PHARMACEUTICAL FORMULATIONS

Abstract: The present disclosure relates to compounds of Formula (I) and (II), compositions containing the compounds (alone or in combination with other agents), and their use to prevent, mitigate or treat a) damage induced by ionizing radiation, b) inflammation or c) cancer.

Scheme:

![Scheme](image-url)

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)
(19) World Intellectual Property Organization
International Bureau
(43) International Publication Date
13 November 2014 (13.11.2014)
(10) International Publication Number
WO 2014/182789 A3

(51) International Patent Classification:
C07D 241/22 (2006.01) A61K 31/496 (2006.01)
C07D 241/18 (2006.01) A61P 35/00 (2006.01)

(21) International Application Number:
PCT/US2014/037110

(22) International Filing Date:
7 May 2014 (07.05.2014)

(25) Filing Language:
English

(26) Publication Language:
English

(30) Priority Data:
61/820,447 7 May 2013 (07.05.2013) US


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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))

(88) Date of publication of the international search report:
11 December 2014
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

C07D 241/22(2006.01)i, C07D 241/18(2006.01)i, A61K 31/496(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 241/22; C07D 241/18; A61K 31/496; 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) & Keywords: 1-(4-nitrophenylsulfonyl)piperazine, N,N-diethyl-4-nitrobenzenesulfonamide, 1-(4-nitrophenylsulfonyl)-1,4-diazepane, 3-(4-nitrophenylsulfonyl)-tetrahydrothiophene, radiomitigator, radioprotectant

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>See compounds 4a and 4b</td>
<td>5,7,13</td>
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<tr>
<td>A</td>
<td>See compounds 2h, 2i and 2j</td>
<td>5,7,12-13</td>
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<tr>
<td>A</td>
<td>See compound 3j</td>
<td>4,6,8-13</td>
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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 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

"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

"&" document member of the same patent family

Date of the actual completion of the international search

31 October 2014 (31.10.2014)

Date of mailing of the international search report

31 October 2014 (31.10.2014)

Name and mailing address of the ISA/KR

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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.: 15-19  
   | because they relate to subject matter not required to be searched by this Authority, namely:  
   | Claim sl5-19 pertain to methods for treatment of the human body by surgery or therapy, as well as diagnostic methods practiced on the human body, and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of the PCT and Rule 39.l(iv) of the Regulations under the PCT, to search.

2. | Claims Nos.: 16  
   | 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:  
   | Claim 16 is unclear because it refers to multiple dependent claim 15 which does not comply with PCT Rule 6.4(a).

   | 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 treated multiple inventions in this international application, as follows:

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

2. | All searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.

3. | 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.
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
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<tr>
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Form PCT/ISA/210 (patent family annex) (July 2009)