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MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
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KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

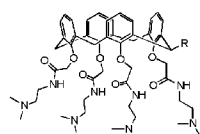
Published:

- *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:

12 June 2014

(54) Title: RADIOLABELED ANALOG(S) OF COMPOUND 0118 AND USE THEREOF IN CONNECTION WITH PET AND/OR SPECT IMAGING TO DETERMINE WHETHER A PHARMACEUTICAL CONTAINING COMPOUND 0118 IS A CANDIDATE CANCER TREATMENT FOR A PATIENT

General structure compound 0118
analogues for therapeutic applications:

Specific examples (compounds that have been prepared and evaluated):

- R = -methyl (compound 18a) (compound 13)
 -n-propyl (compound 18b)
 -n-pentyl (compound 18c) (compound 14)

FIGURE 13

(57) Abstract: A method for determining whether compound 0118 is a candidate treatment for a patient includes processing, via a processor, image data of tissue of interest of a patient including a cancer to determine whether a radiolabeled analog of compound 0118 is present in the tissue of interest represented in the image data and generating a signal indicating that compound 0118 is a candidate treatment for the patient in response to the determining that the radiolabeled analog of compound 0118 is present in a predetermined amount in the tissue of interest represented in the image data, wherein the presence of the radiolabeled analog of compound 0118 in the tissue of interest indicates presence of a sub-type of cancer having a galectin-1 molecular target, which is a sub-type of treatable by compound 0118.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2013/054744

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K49/00 A61K51/04 C07B59/00
ADD. A61P35/00

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 C07B

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 practicable, search terms used)

EPO-Internal, BIOSIS, EMBASE, PASCAL, CHEM ABS Data, DISSERTATION ABS, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DINGS RUUD P M ET AL: "DESIGN OF NONPEPTIDIC TOPOMIMETICS OF ANTIANGIOGENIC PROTEINS WITH ANTITUMOR ACTIVITIES", JOURNAL OF THE NATIONAL CANCER INSTITUTE, vol. 98, no. 13, 5 July 2006 (2006-07-05), pages 932-936, XP002676483, ISSN: 0027-8874 cited in the application the whole document ----- -/--	1-10



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

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22/04/2014

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2013/054744

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DINGS RUUD P M ET AL: "Antitumor Agent Calixarene 0118b Targets Human Galectin-1 as an Allosteric Inhibitor of Carbohydrate Binding", JOURNAL OF MEDICINAL CHEMISTRY, vol. 55, no. 11, 10 May 2012 (2012-05-10), pages 5121-5129, XP009160653, ISSN: 0022-2623, DOI: 10.1021/JM300014Q [retrieved on 2012-05-10] abstract page 5125 - page 5126 -----	1-10
X	WO 2006/042104 A2 (UNIV MINNESOTA [US]; MAYO KEVIN H [US]; HOYE THOMAS R [US]; CHEN XUEME) 20 April 2006 (2006-04-20) example 48 -----	1-10
X	ANTHONY W. COLEMAN ET AL: "Toxicity and biodistribution of para-sulfonato-calix[4]arene in mice", NEW JOURNAL OF CHEMISTRY, vol. 32, no. 5, 1 January 2008 (2008-01-01), page 780, XP055093103, ISSN: 1144-0546, DOI: 10.1039/b718962a the whole document -----	1-10
X	CARL REDSHAW ET AL: "Rhenium Calix[4]arenes: Precursors to Novel Imaging and Cancer Therapy Agents", EUROPEAN JOURNAL OF INORGANIC CHEMISTRY, vol. 2008, no. 17, 1 June 2008 (2008-06-01), pages 2698-2712, XP055092954, ISSN: 1434-1948, DOI: 10.1002/ejic.200800275 abstract page 2698 - page 2699 page 2707 -----	1-10
X	KJELD J. C. VAN BOMMEL ET AL: "Calix[4]arene Rhenium(V) Complexes as Potential Radiopharmaceuticals", INORGANIC CHEMISTRY, vol. 39, no. 18, 1 September 2000 (2000-09-01), pages 4099-4106, XP055093044, ISSN: 0020-1669, DOI: 10.1021/ic000172x abstract page 4099 - page 4100 page 4103, left-hand column, paragraph Conclusion ----- -/--	1-10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2013/054744

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.:
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.:

1-10

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.

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2013/054744

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96/14878 A2 (MOLECULAR BIOSYSTEMS INC [US]) 23 May 1996 (1996-05-23) examples	1-10
X	----- Xiaoyuan Chen ET AL: "Ionizable Calixarene-Crown Ethers with High Selectivity for Radium over Light Alkaline Earth Metal Ions", Inorganic Chemistry, vol. 38, no. 23 1 November 1999 (1999-11-01), 1999, pages 5449-5452, XP055093211, DOI: 10.1021/ic990135+ Retrieved from the Internet: URL: http://pubs.acs.org/doi/pdf/10.1021/ic990135+ abstract page 5449 - page 5450, left-hand column, line 3 figures page 5452, right-hand column	1-10
X	----- ALEXANDER T. YORDANOV ET AL: "Synthesis and biodistribution study of a new 211At-calix[4]arene complex", JOURNAL OF LABELLED COMPOUNDS AND RADIOPHARMACEUTICALS, vol. 43, no. 12, 30 October 2000 (2000-10-30), pages 1219-1225, XP055092252, ISSN: 0362-4803, DOI: 10.1002/1099-1344(20001030)43:12<1219::AID-JLCR409>3.0.CO;2-P the whole document -----	1-10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2013/054744

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2006042104	A2	20-04-2006	
		AT 536177 T	15-12-2011
		CA 2583092 A1	20-04-2006
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		EP 1802291 A2	04-07-2007
		EP 2404895 A1	11-01-2012
		ES 2378999 T3	19-04-2012
		PT 1802291 E	12-03-2012
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		US 2012309801 A1	06-12-2012
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		US 5622687 A	22-04-1997
		US 5846515 A	08-12-1998
		WO 9614878 A2	23-05-1996

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-10

a method for determining if compound 0118 can be used for cancer treatment

2. claims: 11-19

monitoring cancer treatment using compound 0118

3. claims: 20-27

a computing system recommending to use 0118 or not

4. claims: 28-34, 36, 37(completely); 41-44(partially)

a radiolabelled analog of compound 0118, and its use in the inhibition of tumorigenesis.

5. claims: 35(completely); 41-44(partially)

a non-radioactive analogue of compound 0118, and its use in the inhibition of tumorigenesis.

6. claims: 38-40(completely); 41-44(partially)

a macromolecular structure containing two or more units of compound 0118 analogue, and its use in the inhibition of tumorigenesis.

7. claims: 41-43, 45(all partially)

a radiolabelled analog of compound 0118 for use in the inhibition of diabetic retinopathy.

8. claims: 41-43, 45(all partially)

a non-radiolabelled analog of compound 0118 for use in the inhibition of diabetic retinopathy.

9. claims: 41-43, 45(all partially)

a macromolecular structure containing two or more units of compound 0118 analogue for use in the inhibition of diabetic retinopathy.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

10. claims: 41-43, 45(all partially)

a radiolabelled analog of compound 0118 for use in the inhibition of neovascular glaucoma.

11. claims: 41-43, 45(all partially)

a non-radiolabelled analog of compound 0118 for use in the inhibition of neovascular glaucoma.

12. claims: 41-43, 45(all partially)

a macromolecular structure containing two or more units of compound 0118 analogue for use in the inhibition of neovascular glaucoma.

13. claims: 41-43, 45(all partially)

a radiolabelled analog of compound 0118 for use in the inhibition of rheumatoid arthritis.

14. claims: 41-43, 45(all partially)

a non-radiolabelled analog of compound 0118 for use in the inhibition of rheumatoid arthritis.

15. claims: 41-43, 45(all partially)

a macromolecular structure containing two or more units of compound 0118 analogue for use in the inhibition of rheumatoid arthritis.

16. claims: 41-43, 45(all partially)

a radiolabelled analog of compound 0118 for use in the inhibition of restenosis.

17. claims: 41-43, 45(all partially)

a non-radiolabelled analog of compound 0118 for use in the inhibition of restenosis.

18. claims: 41-43, 45(all partially)

a macromolecular structure containing two or more units of

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

compound 0118 analogue for use in the inhibition of
restenosis.
