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61/155,624 26 February 2009 (26.02.2009) US
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**Declarations under Rule 4.17:**

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

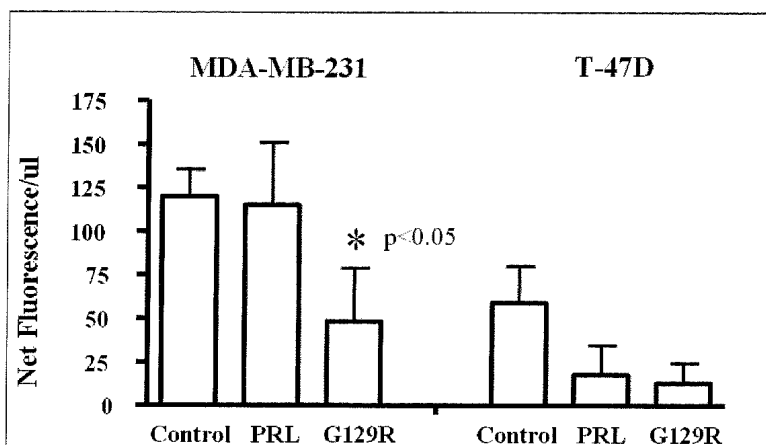
**Published:**

- with international search report (Art. 21(3))

[Continued on next page]

(54) Title: COMPOSITIONS AND METHODS FOR VISUALIZING AND ELIMINATING CANCER STEM CELLS

Figure 1



(57) Abstract: The present invention relates generally to the field of cancer diagnosis and treatment, and more particularly to compositions and methods that may be useful for eliminating cancer cells with stem-like characteristics. The disclosed compositions and methods may also be useful for managing breast cancer, ovarian cancer, cervical cancer or endometrial (uterine) cancer with metastases; and visualizing the cancer cells in patient's body. The compositions of the instant invention include human prolactin receptor antagonist G129R.

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- *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))*
- (88) **Date of publication of the international search report:**  
17 February 2011

## A. CLASSIFICATION OF SUBJECT MATTER

INV. A61K38/22 G01N33/74 A61P35/00 A61P35/04

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 G01N 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, WPI Data, BIOSIS, EMBASE, CHEM ABS Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99/58142 A1 (CHEN WEN Y [US]; WAGNER THOMAS E [US]) 18 November 1999 (1999-11-18)	2-7, 9, 10
Y	page 21, line 9 - line 18; claims ----- -/--	1-11



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 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

12 May 2010

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28/12/2010

Name and mailing address of the ISA/

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## C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>BONTENBAL M ET AL: "FEASIBILITY, ENDOCRINE AND ANTI-TUMOUR EFFECTS OF A TRIPLE ENDOCRINE THERAPY WITH TAMOXIFEN, A SOMATOSTATIN ANALOGUE AND AN ANTIPROLACTIN IN POST-MENOPAUSAL METASTATIC BREAST CANCER: A RANDOMIZED STUDY WITH LONG-TERM FOLLOW-UP"</p> <p>BRITISH JOURNAL OF CANCER, NATURE PUBLISHING GROUP, LONDON, GB, vol. 77, no. 1, 1 January 1998 (1998-01-01), pages 115-122, XP002921791 ISSN: 0007-0920</p>	2-4,9,10
Y	abstract; figures; tables	1-11
X	<p>MICHELE L SCOTTI ET AL: "Additive effects of a prolactin receptor antagonist, G129R, and herceptin on inhibition of HER2-overexpressing breast cancer cells"</p> <p>BREAST CANCER RESEARCH AND TREATMENT, KLUWER ACADEMIC PUBLISHERS, BO, vol. 111, no. 2, 23 October 2007 (2007-10-23), pages 241-250, XP019600754 ISSN: 1573-7217</p>	2-7,9,10
Y	abstract; figures	1-11
A	<p>REYNOLDS C ET AL: "EXPRESSION OF PROLACTIN AND ITS RECEPTOR IN HUMAN BREAST CARCINOMA"</p> <p>ENDOCRINOLOGY, BALTIMORE, MD, US LNKD-DOI:10.1210/EN.138.12.5555, vol. 138, no. 12, 1 January 1997 (1997-01-01), pages 5555-5560, XP002921793 ISSN: 0013-7227</p>	1-11
A	<p>BHATTACHARYYA SIBAPRASAD ET AL: "Synthesis and evaluation of near-infrared (NIR) dye-herceptin conjugates as photoacoustic computed tomography (PCT) probes for HER2 expression in breast cancer"</p> <p>BIOCONJUGATE CHEMISTRY, vol. 19, no. 6, June 2008 (2008-06), pages 1186-1193, XP002582132 ISSN: 1043-1802</p>	1-11
	<p>-----</p> <p style="text-align: center;">-/--</p>	

## C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	TIAN X -S ET AL: "Clinicopathologic and prognostic characteristics of triple-negative breast cancer" ONKOLOGIE 200811 CH LNKD- DOI:10.1159/000162288, vol. 31, no. 11, November 2008 (2008-11), pages 610-614, XP009133486 ISSN: 0378-584X abstract; claims; figures -----	1,5-11

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2010/024340

## 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.:

1-11

### 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.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

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

1. claims: 1-11

Methods for cancer treatment comprising administering a human prolactin receptor antagonist.

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2. claims: 12-15

Method for detecting cancer cells by administering labelled prolactin receptor antagonists.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9958142	A1	18-11-1999	
		AT 366114 T	15-07-2007
		AU 3895299 A	29-11-1999
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		DE 69936451 T2	13-03-2008
		DK 1079851 T3	24-09-2007
		EP 1079851 A1	07-03-2001
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		JP 2002515404 T	28-05-2002
		PT 1079851 E	08-10-2007
		US 2003022833 A1	30-01-2003

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