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7 March 2013

(54) **Title:** TREATING CANCER

(57) **Abstract:** A method for treating cancer comprising applying peripheral blood from a patient or subject to an apheresis column loaded with a solid support comprising one or more binding reagents capable of specifically binding to a chemokine receptor, optionally the chemokine receptor CCR7, CCR5, CCR6, CCR8, CXCR4, CXCR7, CCR4, CCR9, CCR10, CXCR3 or CXCR5 or to a Treg receptor immobilized directly or indirectly on the support thus removing one or more chemokine receptor, optionally CCR7, CCR5, CCR6, CCR8, CXCR4, CXCR7, CCR4, CCR9, CCR10, CXCR3 or CXCR5 or Treg receptor expressing cells from the peripheral blood of the patient or subject. Various companion diagnostic methods and useful binding reagents are also described.



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INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER

INV. A61M1/36 B01J20/32

ADD.

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)

A61M B01J

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)

EP0-Internal, BIOSIS, Sequence Search, EMBASE, PAJ, 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	WO 2010/029317 A2 (IBD COLUMN THERAPIES INTERNAT [SE]; WINQVIST OLA [SE]; COTTON GRAHAM []) 18 March 2010 (2010-03-18) cited in the application the whole document ----- -/--	1-8,10, 11,19, 21-30, 32,38, 45-58, 60-65, 100-104

☒ 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

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02/01/2013

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

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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	EP 2 067 495 A1 (TORAY INDUSTRIES [JP]) 10 June 2009 (2009-06-10)	1-8,10, 11,19, 21-30, 32,38, 45-58, 60-65, 100-104
Y	abstract paragraphs [0006], [0008], [0012] examples 1-10	1-8,10, 11,19, 21-30, 32,38, 45-58, 60-65, 100-104
Y	----- , 1 January 2010 (2010-01-01), XP055036910, Retrieved from the Internet: URL:http://www.jeccr.com/content/pdf/1756- 9966-29-16.pdf [retrieved on 2012-08-31] abstract page 3 - page 7	1-8,10, 11,19, 21-30, 32,38, 45-58, 60-65, 100-104
Y	----- IWA0 TAKANAMI: "Overexpression of CCR7 mRNA in nonsmall cell lung cancer: Correlation with lymph node metastasis", INTERNATIONAL JOURNAL OF CANCER, vol. 105, no. 2, 10 June 2003 (2003-06-10) , pages 186-189, XP055037030, ISSN: 0020-7136, DOI: 10.1002/ijc.11063 abstract page 186, column 1 tables 1, 2 "Discussion"	1-8,10, 11,19, 21-30, 32,38, 45-58, 60-65, 100-104
E	----- WO 2012/112724 A1 (EXTHERA MEDICAL LLC [US]; MCCREA KEITH [US]; WARD ROBERT S [US]; PITAR) 23 August 2012 (2012-08-23) the whole document -----	66,67

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2012/051351

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.:

see additional sheet(s)

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: 10, 11, 19, 32, 100-104(completely); 1-8, 21-30, 38, 45-58, 60-69(partially)

A method of treating/diagnosing cancer by subjecting a patients blood to apheresis with a column loaded with a CCR7 receptor ligand, the column containing said ligand and the specific ligand.

- 2-11. claims: 1-9, 12-18, 20-31, 33-99, 105-111, 123-128(all partially)

A method of treating/diagnosing cancer or an inflammatory condition by subjecting a patients blood to apheresis with a column loaded with a CCR5, CCR6, CCR8, CXCR4, CXCR7, CCR4, CCR9, CCR10, CXCR3 OR CXCR5 receptor ligand, the column containing said ligand and the specific ligands (each particular receptor represents a single invention).

12. claims: 112-120

A method of diagnosing/monitoring cancer by determining the levels of one or more Treg receptor expressing cell in a patient.

13. claims: 129-135

A modified CXCL10 chemokine.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2010029317 A2	18-03-2010	AU 2009290694 A1 CA 2736632 A1 CN 102186880 A EA 201100452 A1 EP 2331568 A2 JP 2012501708 A KR 20110057222 A US 2011224645 A1 WO 2010029317 A2	18-03-2010 18-03-2010 14-09-2011 30-12-2011 15-06-2011 26-01-2012 31-05-2011 15-09-2011 18-03-2010
EP 2067495 A1	10-06-2009	CA 2664770 A1 CN 101522232 A EP 2067495 A1 KR 20090074172 A US 2010025335 A1 WO 2008038785 A1	03-04-2008 02-09-2009 10-06-2009 06-07-2009 04-02-2010 03-04-2008
WO 2012112724 A1	23-08-2012	NONE	