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- (75) Inventors/Applicants (for US only): FLEMING, Mark, Andrew [US/US]; 3 Ivy Circle, Winchester, MA 01890 (US). HARE, Brian, J. [US/US]; 34 Hamilton Road #502, Arlington, MA 02474 (US).
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CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

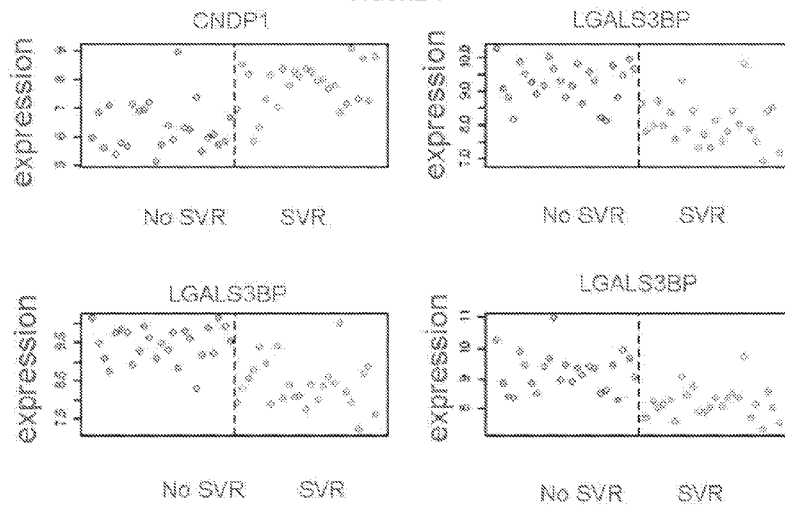
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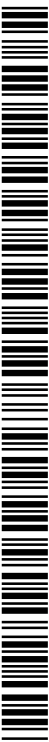
- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
- with sequence listing part of description (Rule 5.2(a))
- (88) Date of publication of the international search report:
10 January 2013

(54) Title: BIOMARKERS FOR HCV INFECTED PATIENTS

FIGURE 1



(57) Abstract: The invention relates to biomarkers measurable in a human subject that have prognostic value with respect to efficacy of therapeutic treatments for Hepatitis C viral infection. The markers also are believed to have value for diagnosis liver health/liver damage.



INTERNATIONAL SEARCH REPORT

International application No PCT/US2011/057347

A. CLASSIFICATION OF SUBJECT MATTER INV. G01N33/576 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) G01N 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, WPI Data, Sequence Search				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
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A	MASAHIKO KODA ET AL: "Fibroindex, a practical index for predicting significant fibrosis in patients with chronic hepatitis C", HEPATOLOGY, vol. 45, no. 2, 1 February 2007 (2007-02-01), pages 297-306, XP55020655, ISSN: 0270-9139, DOI: 10.1002/hep.21520 whole doc, in particular p. 305, left col. ----- -/--	1,3-8, 12-30, 32,35, 37,38, 40,41, 43-46		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
* Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> "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 </td> <td style="width: 50%; border: none; vertical-align: top;"> "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 </td> </tr> </table>			"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
"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	Date of mailing of the international search report			
12 November 2012	19/11/2012			
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Lüdemann, Susanna			

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2011/057347

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ZEREMSKI MARIJA ET AL: "Interferon gamma-inducible protein 10 - A predictive marker of successful treatment response in hepatitis C virus/HIV-coinfected patients", JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES, LIPPINCOTT WILLIAMS AND WILKINS, PHILADELPHIA, PA, US, vol. 45, no. 3, 1 July 2007 (2007-07-01), pages 262-268, XP009157012, ISSN: 1525-4135, DOI: 10.1097/QAI.0B013E3180559219 whole doc, in particular title, abstract and fig.2	1,3-8, 12-30, 32,35, 37,38, 40,41, 43-46
X	----- T. POYNARD ET AL: "Biochemical markers of liver fibrosis in patients infected by hepatitis C virus: longitudinal validation in a randomized trial", JOURNAL OF VIRAL HEPATITIS, vol. 9, no. 2, 1 March 2002 (2002-03-01), pages 128-133, XP55020656, ISSN: 1352-0504, DOI: 10.1046/j.1365-2893.2002.00341.x whole doc, in particular p. 128, right col. - p. 129, left col, first paragraph; p. 129 (left col. 2nd paragraph and table 1)	1,3-8, 12-30, 32,35, 37,38, 40,41, 43-46
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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2011/057347

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	WO 2009/127693 A1 (INST NAT SANTE RECH MED [FR]; LOTTEAU VINCENT [FR]) 22 October 2009 (2009-10-22) whole doc, in particular claim 6 and 9, p. 13, line 33, p. 69, line 28	1-29,32, 33,35, 38-40, 45-47
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X	US 2009/117591 A1 (CORRALES IZQUIERDO FERNANDO [ES] ET AL) 7 May 2009 (2009-05-07) whole doc, in particular [0022], [0004], claims 1,9 and example on p. 4	1-29,32, 33,35, 36, 38-40, 45-47
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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.:

1, 3-8, 12-30, 32, 35, 37, 40, 41, 43-46(all partially)
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.

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, 3-8, 12-30, 32, 35, 37, 38, 40, 41, 43-46(all partially)

A method for evaluating a human subject infected with hepatitis C virus (HCV) for a treatment, the method comprising a) obtaining the measurement of the biomarker LPA and b) evaluating the subject for HCV treatment from the output of a model, wherein the inputs to said model comprise said measurement of the at least one biomarker; furthermore methods of treating HCV infection, a kit, computer-readabel medium, a medical diagnostic test system, a method of developing a model, use of at least one antibody, all based on LPA as marker.

- 2-34. claims: 1-47(partially)

A method for evaluating a human subject infected with hepatitis C virus (HCV) for a treatment, the method comprising a) obtaining the measurement of a biomarker and b) evaluating the subject for HCV treatment from the output of a model, wherein the inputs to said model comprise said measurement of the at least one biomarker; furthermore methods of treating HCV infection, a kit, computer-readabel medium, a medical diagnostic test system, a method of developing a model, use of at least one antibody, wherein the marker is CDNP1, ... FCGBP (list of markers according to list of claim 1).

- 35-39. claims: 2-9, 12-29, 31, 33, 34, 36, 37, 39, 40, 42-45, 47(all partially)

A method for evaluating a human subject infected with hepatitis C virus (HCV) for a treatment, the method comprising a) obtaining the measurement of a biomarker and b) evaluating the subject for HCV treatment from the output of a model, wherein the inputs to said model comprise said measurement of the at least one biomarker; furthermore methods of treating HCV infection, a kit, computer-readabel medium, a medical diagnostic test system, a method of developing a model, use of at least one antibody, all based on either PZP, APOC4, CLEC3B, APOB or CD5L as marker (list of markers according to list of claim 2).

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2011/057347

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