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(71) Applicant (for all designated States except US): **FEBIT HOLDING GMBH** [DE/DE]; Im Neuenheimer Feld 519, 69120 Heidelberg (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KELLER, Andreas** [DE/DE]; Albert-Schweitzer Str. 6, 66346 Püttlingen (DE). **MEDER, Benjamin** [DE/DE]; Fliederweg 1, 69221 Dossenheim (DE). **KATUS, Hugo** [DE/DE]; Philosophenweg 17, 69120 Heidelberg (DE). **VOGEL, Britta** [DE/DE]; Gerhart Hauptmann Str. 34, 69120 Heidelberg (DE). **BEIER, Markus** [DE/DE]; Marc-Aurel-Weg 20, 69469 Weinheim (DE).

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(54) Title: COMPLEX SETS OF MIRNAS AS NON-INVASIVE BIOMARKERS FOR DILATED CARDIOMYOPATHY

(57) Abstract: The present invention relates to non-invasive methods, kits and means for diagnosing and/or prognosing of dilated cardiomyopathy in a body fluid sample from a subject. Further, the present invention relates to set of polynucleotides or sets of primer pairs for detecting sets of miRNAs for diagnosing and/or prognosing of dilated cardiomyopathy in a body fluid sample from a subject. In addition, the present invention relates to sets of miRNAs for diagnosing and/or prognosing of dilated cardiomyopathy in a body fluid sample from a subject.



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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2012/060927

A. CLASSIFICATION OF SUBJECT MATTER

INV. C12Q1/68

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)

C12Q

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, EMBASE, BIOSIS, Sequence Search, 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	VOELLENKLE CHRISTINE ET AL: "MicroRNA signatures in peripheral blood mononuclear cells of chronic heart failure patients", PHYSIOLOGICAL GENOMICS, AMERICAN PHYSIOLOGICAL SOCIETY, US, vol. 42, no. 3, 1 August 2010 (2010-08-01), pages 420-426, XP008133127, ISSN: 1094-8341, DOI: 10.1152/PHYSIOLGENOMICS.00211.2009 [retrieved on 2010-05-18] abstract; figure 1	1-22
X	WO 2009/012468 A2 (UNIV COLORADO [US]; PORT JONATHAN DAVID [US]; SUCHAROV CARMEN [US]; BR) 22 January 2009 (2009-01-22) paragraphs [0041], [0079], [0080] ----- -/-	1-22



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

20 August 2012

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European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Nurmi, Jussi

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	WO 2010/139810 A1 (FEBIT HOLDING GMBH [DE]; KELLER ANDREAS [DE]; MEESE ECKART [DE]; BORRI) 9 December 2010 (2010-12-09) page 10, line 20; claims 17,24 page 32, lines 1-11 -----	5-9, 11-18
X	SHLOMIT GILAD ET AL: "Serum MicroRNAs Are Promising Novel Biomarkers", PLOS ONE, PUBLIC LIBRARY OF SCIENCE, SAN FRANCISCO, CA; US, vol. 3, no. 9, 1 September 2008 (2008-09-01), pages 1-7, XP008145419, ISSN: 1932-6203 page 2, column 1, paragraphs 3,6; figure 4 -----	5-9, 11-18
X	BENJAMIN MEDER ET AL: "MicroRNA signatures in total peripheral blood as novel biomarkers for acute myocardial infarction", BASIC RESEARCH IN CARDIOLOGY, STEINKOPFF-VERLAG, DA, vol. 106, no. 1, 1 October 2010 (2010-10-01), pages 13-23, XP019855605, ISSN: 1435-1803, DOI: 10.1007/S00395-010-0123-2 page 14, column 2, paragraph 2 -----	5-9, 11-18

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2012/060927

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.:

1-22(partially)

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: 1-22(partially)

Methods, sets of polynucleotides, uses of sets of polynucleotides, means, kits, sets of miRNAs and uses of sets of miRNAs for diagnosing and/or prognosing dilated cardiomyopathy by determining an expression profile of a set of at least two miRNAs wherein one of the miRNAs is SEQ ID NO: 1, a fragment thereof or a sequence having 80 % sequence identity thereto.

2-387. claims: 1-22(partially)

Methods, sets of polynucleotides, uses of sets of polynucleotides, means, kits, sets of miRNAs and uses of sets of miRNAs for diagnosing and/or prognosing dilated cardiomyopathy by determining an expression profile of a set of at least two miRNAs wherein one of the miRNAs is SEQ ID NO: 2, a fragment thereof or a sequence having 80 % sequence identity thereto.

[idem for each of the miRNAs corresponding to SEQ ID NOS: 3-387, each individual miRNA representing a separate invention]

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2012/060927

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2009012468	A2	22-01-2009	
		AU 2008275877 A1	22-01-2009
		CA 2693031 A1	22-01-2009
		CN 101802227 A	11-08-2010
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		US 2012157336 A1	21-06-2012
		US 2012157337 A1	21-06-2012
		WO 2010139810 A1	09-12-2010
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		WO 2010139812 A1	09-12-2010
