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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,

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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**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))
- with sequence listing part of description (Rule 5.2(a))

- (88) **Date of publication of the international search report:**  
20 December 2012



WO 2012/140148 A3

(54) **Title:** JUNCTION PLAKOGLOBIN FOR DIAGNOSIS OF CARDIOVASCULAR DISEASES

(57) **Abstract:** The invention relates to a method for diagnosis of cardiovascular disease in a patient, comprising detecting, in a sample obtained from said patient, junction plakoglobin (SEQ ID 001) or a polypeptide related thereto. It further relates to devices and kits for detection of junction plakoglobin.

INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2012/056693

A. CLASSIFICATION OF SUBJECT MATTER  
INV. G01N33/68  
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)  
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, BIOSIS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/212738 A1 (HALEY JOHN D [US] ET AL) 13 September 2007 (2007-09-13) paragraphs [0097], [0151] -----	9-11
X	US 2006/216292 A1 (HOPF CARSTEN [DE]) 28 September 2006 (2006-09-28) claims 1-68; sequence 2 -----	9-11
X	WO 2009/046174 A1 (UNIV OHIO STATE RES FOUND [US]; FORTNEY JILL A [US]; BINKLEY PHILIP F) 9 April 2009 (2009-04-09) paragraph [0043] ----- -/--	1-14

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  16 July 2012	Date of mailing of the international search report  12/10/2012
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  Steinheimer, K

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2012/056693

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>RAFFAELLA LOMBARDI ET AL: "Molecular Genetics and Pathogenesis of Arrhythmogenic Right Ventricular Cardiomyopathy: A Disease of Cardiac Stem Cells", PEDIATRIC CARDIOLOGY, SPRINGER-VERLAG, US, vol. 32, no. 3, 26 January 2011 (2011-01-26), pages 360-365, XP019888582, ISSN: 1432-1971, DOI: 10.1007/S00246-011-9890-2 the whole document</p>	1-14
X,P	<p>-----            DATABASE BIOSIS [Online]            BIOSCIENCES INFORMATION SERVICE,            PHILADELPHIA, PA, US;            May 2011 (2011-05),            PIGORS MANUELA ET AL: "Lack of plakoglobin leads to lethal congenital epidermolysis bullosa: a novel clinico-genetic entity",            XP002679760,            Database accession no. PREV201100281015            abstract            -----</p>	1-14

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP2012/056693

## Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, the international search was carried out on the basis of:
  - a. (means)
    - on paper
    - in electronic form
  - b. (time)
    - in the international application as filed
    - together with the international application in electronic form
    - subsequently to this Authority for the purpose of search
2.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
3. Additional comments:

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP2012/056693

## 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.:

1-14(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: 1-14(partially)

These claims concern methods which involve junction plakoglobin (Seq ID 1) for diagnosis of cardiovascular diseases as defined in claims 1-8, surfaces comprising a ligand reactive to junction plakoglobin (Seq ID 1) (claim 9), a device comprising such ligand (claims 10-11, a kit (claims 12-13 or a use of said surface or device in the method of claims 1-8 (claim 14).

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2-9. claims: 1-14(partially)

see above, but involving Seq ID 2/4 or 7 or 8 or 9 or 10 or 11 or 12 or 13, respectively.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2012/056693
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007212738	A1	13-09-2007	EP 2135086 A2 23-12-2009
			JP 2010527232 A 12-08-2010
			US 2007212738 A1 13-09-2007
			WO 2008127718 A2 23-10-2008
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US 2006216292	A1	28-09-2006	AT 371724 T 15-09-2007
			CA 2537844 A1 17-03-2005
			DE 602004008658 T2 12-06-2008
			DK 1670903 T3 02-01-2008
			EP 1670903 A2 21-06-2006
			ES 2291917 T3 01-03-2008
			US 2006216292 A1 28-09-2006
			WO 2005023833 A2 17-03-2005
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WO 2009046174	A1	09-04-2009	US 2010229251 A1 09-09-2010
			WO 2009046174 A1 09-04-2009
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