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Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

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))*

(88) **Date of publication of the international search report**:
14 March 2013

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(54) **Title**: MOLECULES SPECIFICALLY BINDING PANCREATIC BETA CELLS BIOMARKERS

(57) **Abstract**: The present invention provides a synthetic peptide molecule that specifically binds an FXYD2-gamma isoform of pancreatic beta cells, said synthetic peptide molecule has 25 amino acids.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/062093

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07K14/47 G01N33/569 A61P1/18 A61P5/48
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 C07K

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, 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 2009/101181 A2 (UNIV BRUXELLES [BE]; EUROGENTEC [BE]; INST SYSTEMS BIOLOGY [US]; EIZIR) 20 August 2009 (2009-08-20) cited in the application page 22, line 7 - line 19; examples a3-a5 page 53, line 25 - line 35; examples 4,5 -----	3,5-14
A	WO 2010/096930 A1 (UNIV MCGILL [CA]; SCHIRRMACHER RALF [CA]; SCHNEIDER STEPHAN [DE]) 2 September 2010 (2010-09-02) paragraph [0044]; examples -----	3,5-14

☐ 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	Date of mailing of the international search report
5 November 2012	30/01/2013

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2012/062093

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2009101181 A2	20-08-2009	EP 2247717 A2	10-11-2010
		JP 2011515071 A	19-05-2011
		US 2010322850 A1	23-12-2010
		WO 2009101181 A2	20-08-2009
WO 2010096930 A1	02-09-2010	NONE	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2012/062093

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)

   [X] on paper

   [X] in electronic form

   b. (time)

   [ ] in the international application as filed

   [ ] together with the international application in electronic form

   [X] subsequently to this Authority for the purpose of search

2. [X] 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/EP2012/062093

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.:

3(completely); 1, 2, 5-14(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: 3(completely); 1, 2, 5-14(partially)

peptide of formula X1-X2-X3-X4-X5-X6-X7-X8-X9-X10-X11-X12-X13-X14-X15-X16-X17-X18-X19-X20-X21-X22-X23-X24-X25 wherein X1 is leucine or isoleucine, X2 is proline, X3 is leucine or isoleucine, X4 is serine or threonine, X5 is arginine, lysine or histidine, X6 is histidine, arginine or lysine, X7 is tyrosine, X8, X9 and X10 are glycine, Xll is serine or threonine, X12 is valine, leucine or isoleucine, X13 is proline, X14 phenylalanine or leucine, X15 is tyrosine, X16 is serine or threonine, X17 is histidine, arginine or lysine, X18 is serine or threonine, X19 is asparagine or glutamine, X20 is threonine or serine, X21 and X22 are histidine, arginine or lysine, X23 is threonine or serine, X24 is serine or threonine, X25 is methionine or cysteine, preferably the peptide formula is LPLSRHYGGGSVPFYSHSNTHHTSM; methods for detecting and measuring pancreatic beta cells, methods for targeting pancreatic beta cells, and a kit all using or employing the peptide as defined above

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2. claims: 4(completely); 1, 2, 5-14(partially)

peptide of formula X26-X27-X28-X29-X30-X31-X32-G-G-G-S-V-P-F-Y-S-H-S-X33-X34-X35-X36-X37-X38-X39 wherein X26 is histidine, arginine or lysine, X27 is aspartic acid or glutamic acid, X28 is arginine, lysine or histidine, X29 is leucine or isoleucine, X30 is lysine, arginine or histidine, X31 is serine or threonine, X32 is histidine, lysine or arginine, X33 is isoleucine or leucine, X34 is histidine, arginine or lysine, X35 is alanine, X36 is histidine, lysine or arginine, X37 is leucine or isoleucine, X38 is proline, X39 is glutamine or asparagine, preferably the peptide formula is HDRLKSHGGGSVPFYSHSIHAHLPQ, methods for detecting and measuring pancreatic beta cells, methods for targeting pancreatic beta cells, and a kit all using or employing the peptide as defined above

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3. claims: 1, 2, 5-14(all partially)

further peptides that specifically bind an FXYD2-gamma isoform of pancreatic beta cells, different to those peptides as defined in invention 1 and 2, including methods for detecting and measuring pancreatic beta cells, methods for targeting pancreatic beta cells, and a kit all using or employing the peptide as defined above

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