Abstract: The disclosure provides biomarkers, methods, devices, reagents, systems, and kits for detecting and diagnosing a cancer and particularly a pancreatic cancer. The biomarkers can be used alone or in various combinations for diagnosis. The methods comprise detecting in a biological sample from an individual, at least one biomarker value corresponding to at least one biomarker selected from the group of biomarkers provided in Table 1, the individual is classified as having pancreatic cancer, or the likelihood of the individual having pancreatic cancer based on the at least one biomarker value. Methods are also provided for diagnosing cancer comprising detecting in a biological sample from an individual, at least one biomarker value corresponding to at least one biomarker selected from the group of biomarkers provided in Table 19, the individual is classified as having cancer or the likelihood of the individual having cancer based on the at least one biomarker value.

Title: PANCREATIC CANCER BIOMARKERS AND USES THEREOF
INTERNATIONAL SEARCH REPORT

PCT/US 11/47570

According to International Patent Classification (IPC) or to both national classification and IPC

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - C12Q 1/68;G01 N 33/53;G01 N 33/574:C40B 40/08;G01 N 33/50;G06F 13/10 (2012.01 )
USPC - 435/6.1 2, 435/6.1 4, 435/6.17; 435/7.1; 435/7.23; 506/1 7; 702/1 9; 703/2 1

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - C12Q 1/68;G01 N 33/53;G01 N 33/574:C40B 40/08;G01 N 33/50;G06F 13/10 (2012.01 )
USPC - 435/6.12, 435/6.14, 435/6.17; 435/7.1; 435/7.23; 506/17; 702/19; 703/21

Documentary documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC(8) - C12Q 1/68;G01N 33/53;G01N 33/574:C40B 40/08;G01N 33/50;G06F 13/10 (2012.01 ) - see keyword below
USPC - 435/6.12, 435/6.14, 435/6.17; 435/7.1; 435/7.23; 506/17; 702/19; 703/21 - see keyword below

Electronic database consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST(USPTPGPB,EPAB,JAPAB); Medline, Google: tartrate-resistant acid ATPase ,ACPS, TrATPas, cancer, carcinoma, malignant, benign, neoplastic, pancreatitis, gastrointestinal, CA19-9, capture, aptamer, antibody, probe, pancreatitis, gastrointestinal, abdominal mass, immunoassay, histological, cytological, mRNa, mRNa, expression, whole b

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Citation of document with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 2004/0219572 A1 (CHEN et al.) 04 November 2004 (04.11.2004), Abstract, para [0002], [0003], [0004], [0006], [0009], [0020], [0036], [0037], [0038], [0039], [0047], [0062], [0093], [0095], [0101], and Table 2 and 6</td>
<td>1:1-1, 14, 17, 19, 25-33, 36, 39, 41, 66</td>
</tr>
<tr>
<td>US 2008/0171319 A1 (URDEA et al.) 17 July 2008 (17.07.2008), para [0023], [0027], [0063], [0140], [0174], and Table 1</td>
<td>1:1-1, 14, 17, 19, 25-33, 36, 39, 41, 66</td>
</tr>
<tr>
<td>US 2007/0275422 A1 (Lowe) 29 November 2007 (29.11.2007), para [0005], [0010], [0013], [0021], [0023], [0117], and [0130]</td>
<td>2-3, 19, 41</td>
</tr>
<tr>
<td>US 2005/09561 A1 (CHAN et al.) 05 May 2005 (05.05.2005), para [0051], [0132],[0140], [0425], [0541], and [0546]</td>
<td>1:1-11, 14, 17, 19, 25-33, 36, 39, 41, 66</td>
</tr>
<tr>
<td>US 2003/0134343 A1 (BATRA et al.) 17 July 2003 (17.07.2003), para [0003], [0008], [0010], [0011], [0012], [0018], [0027], [0068], [0069], [0087], and [0106]</td>
<td>1:1-11, 14, 17, 19, 25-33, 36, 39, 41, 66</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C.

Date of the actual completion of the international search: 01 February 2012 (01.02.2012)

Date of mailing of the international search report: 23 FEB 2012

Authorized officer: Lee W. Young

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774
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. [x] Claims Nos.: 68 because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

This International Searching Authority found multiple inventions in this international application, as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: claims 1-19, 25-41, 47-60, 66-67, drawn to a method for diagnosing that an individual does or does not have pancreatic cancer, or a method for screening an asymptomatic high risk individual for pancreatic cancer the method comprising: detecting, in a biological sample from an individual, biomarker values that each correspond to one of at least N biomarkers, wherein said individual is classified as having or not having pancreatic cancer, or the likelihood of the individual having pancreatic cancer is determined, based on said biomarker values. The first named invention (claims 1-11, 14, 17, 19, 25-33, 36, 39, 41, 66) is limited to wherein N=2 comprising the first two biomarkers: ACP5 and ACY1 in Table 1. Applicant is invited to elect (an) additional biomarker(s) from Table 1 or Table 9 to be searched by paying additional fee for each election. The exact numbers of claims will be searched will depend upon the numbers of biomarker(s) and the biomarker(s) elected. Note, if one additional marker is elected from Table 19, claims 47-57 will also be searched because ACY1 is also in Table 19.

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 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. [x] 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. 1-11, 14, 17, 19, 25-33, 36, 39, 41, 66, limited to the first two biomarkers: ACP5 and ACY1 in Table 1.

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.

Form PCT/ISA/210 (continuation of first sheet (2)) (July 2009)