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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: NOVEL THERAPEUTIC TARGETS IN CANCER

(57) Abstract: The present invention relates to novel sequences for use in detection, diagnosis and treatment of cancers, especially lymphomas. The invention provides cancer-associated (CA) polynucleotide sequences whose expression is associated with cancer. The present invention provides CA polypeptides associated with cancer that are present on the cell surface and present novel therapeutic targets against cancer. The present invention further provides diagnostic composition and methods for the detection of cancer. The present invention provides monoclonal and polyclonal antibodies specific for the CA polypeptides. The present invention also provides diagnostic tools and therapeutic compositions and methods for screening, prevention and treatment of cancer.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/25835

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **C07H 21/00**(2006.01);**C12Q 1/68**(2006.01)

USPC: 435/6;536/23.1
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)
U.S. :

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)
SCORE, EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X, P	US 6,812,339 B1 (VENTER et al.) 2 November 2004 (02.11.2004) SEQ ID NOs.: 6161 and 10048	1-3 and 34
Y	RIMOKH et al. FVT-1, A noverl human transcription unit affected by variant translocation t(2;18)(p11;q21) of Follicular Lymphoma. Blood, volume 81, 1993, pages 136-142. Accession No. S37652.	1-3, 34
Y	WO 02/0099421 A2 (SAULTER et al.) 12 December 2002 (12.12.02) title, abstract.	1-3 and 34

☐ 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 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
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INTERNATIONAL SEARCH REPORT

International application No.
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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:
Please See Continuation 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 additional fees, this Authority did not invite payment of any 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.: 1-3 and 34

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.

INTERNATIONAL SEARCH REPORT

International application No.
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BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

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, claim(s) 1-3 or 34, drawn to a nucleic acid array and kit for detecting cancer associated nucleic acid. (179 inventions)

Group II, claim(s) 4-8, drawn to a peptide array within the open reading frame of a CA sequence. (237 inventions)

Group III, claim(s) 9-11, drawn to a compound that binds to a polypeptide of the peptide array. (39 inventions)

Group IV, claim(s) 12-32, drawn to an antibody that binds to a specific polypeptide, a pharmaceutical composition, or a kit for diagnosing the presence of cancer in a test sample.. (89 inventions)

Group V, claim(s) 33, drawn to a kit for diagnosing the presence of cancer in a test sample. (39 inventions)

Group VI, claim(s) 35-37, drawn to an electronic library comprising a polynucleotide of a polypeptide from the relevant groups. (217 inventions)

Group VII, claim(s) 38-42, drawn to a method of screening for anticancer activity. (128 inventions)

Group VIII, claim(s) 43-44, drawn to a method of detecting cancer associated with expression of a polypeptide. (89 inventions)

Group IX, claim(s) 45-48, drawn to a method for screening for a bioactive agent. (89 inventions)

Group X, claim(s) 49, drawn to a method for diagnosing cancer. (410 inventions)

Group XI, claim(s) 50-51, drawn to a method of treating cancer. (410 inventions)

Group XII, claim(s) 52-54, drawn to a method for inhibiting the expression of a cancer associated gene. (89 inventions)

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In addition, each Group detailed above reads on distinct Groups drawn to multiple sequences. The sequences are distinct because they are unrelated sequences, and a further lack of unity is applied to each Group. For Groups I, V and VI the applicant must select a single combination of at least two of the listed sequences. For Groups VII and VIII, applicant must select a combination of at least one sequence. For Groups II, III, IV, IX, X, XI, and XIII, a single sequence must be selected. Payment of fees for an additional invention will entitle the Applicants to examination of one additional sequence or combination of sequences.

The inventions listed as Groups I though XII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Groups I through IV each claim physically different chemical structures (i.e. nucleic acids, peptides, compounds, antibodies, pharmaceutical compositions, respectively). Each class of compounds is physically different at the molecular level with its own set of properties. Each is its own special technical feature

Groups IV, V, and I each claim a kit for analyzing the properties of different types of cancer agents (i.e. antibodies, polynucleotides of two different classes). Each is its own special technical feature.

Groups IV, VIII and XII each claim a method for detecting the absence or presence of cancer, but their method steps use different chemical compounds to analyze the cancer. Each set of compounds makes each method a special technical feature.

Group I does not share the special technical feature with the remaining groups about being a nucleic acid array and kit used for detection cancer. Group II does not share the special technical feature of being a polypeptide array. Group III does not share the special technical feature with the remaining groups of being a compound that binds to the polypeptide. Group IV does not share the special technical feature with the remaining groups of being an antibody that binds to a specific peptide. Group V does not share the special technical feature with the remaining groups about being a kit that diagnoses the presence of cancer in a test sample. Group VI does not share a special technical feature with the remaining groups of being an electronic library comprising relevant peptides and nucleotides. Group VII does not share a special technical feature with the remaining groups of being a a method for screening for anticancer activity. Group VIII does not share the special technical feature with the remaining groups of being a method of detecting cancer associated with expression of a polypeptide. Group IX does not share a special technical feature with the remaining groups of being a method for screening for a bioactive agent. Group X does not share a special technical feature with the remaining groups as being a method drawn to diagnosing cancer. Group XI does not share a special technical feature with the remaining groups as being a method of treating cancer. Group XII does not share a special technical feature with the other groups as being a method for inhibiting the expression of a cancer associated gene. Each Group is its own special technical feature.

CALCULATION OF TOTAL INVENTIONS
The number of inventions listed next to each group above represents the number of sequences (polynucleotide and/or polypeptide) associated with each group. For the total number of inventions, the numbers in these twelve groups are summed to arrive at 2015 independent inventions for this case.

Group I = 179 inventions
Group II = 237 Inventions
Group III = 39 inventions
Group IV = 89 inventions
Group V = 39 inventions
Group VI = 217 Inventions
Group VII = 128 Inventions
Group VIII = 89 inventions
Group X = 410 inventions
Group XI = 410 inventions
Group XII = 89 inventions
Total = 2015 inventions