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92122 (US). **TAN, Philip** [US/US]; 2717 State Street, San Diego, California 92130 (US). **WONG-STAAAL, Flossie** [US/US]; 14090 Caminito Vistana, San Diego, California 92130 (US).

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(74) Common Representative: **IMMUSOL INCORPORATED**; 10790 Roselle Street, San Diego, CA 92121 (US).

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(71) Applicant (*for all designated States except US*): **IMMUSOL INCORPORATED** [US/US]; 10790 Roselle Street, San Diego, CA 92121 (US).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **LI, Henry** [US/US]; 7760 Calle Mejor, Carlsbad, California 92009 (US). **KE, Ning** [CN/US]; 15050 Palomino Mesa Rd., San Diego, California 92127 (US). **GRIFMAN, Mirta** [AR/US]; 4873 33rd Street, San Diego, California 92116 (US). **CLAASSEN, Gisela** [US/US]; 1736 Monitor Road, San Diego, California 92110 (US). **HU, Xiuyuan** [CA/US]; 12160 Fidelio Way, San Diego, California 92131 (US). **DEFIFE, Kristin** [US/US]; 4917 Chaucer Avenue, San Diego, California 92120 (US). **HABITA, Cellia** [DZ/US]; 5360 Toscana Way, #G406, San Diego, California 92122 (US). **FAN, Wufang** [US/US]; 8376 Entreken Way, San Diego, California 92129 (US). **RHOADES, Kristina** [US/US]; 6106 Wolfstar Court, San Diego, California

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(54) Title: METHODS OF INHIBITING CANCER GROWTH BY BINDING TO NUCLEAR RECEPTORS

(57) Abstract: The present invention provides methods for identifying agents useful for inhibiting cancer cells by binding to various nuclear receptor proteins, or to the genes or RNA encoding such proteins.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/23821

A. CLASSIFICATION OF SUBJECT MATTER

IPC: A61K 48/00(2006.01)

USPC: 514/44

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. : 514/44

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	UEDA, Y. Expression of Nerve Growth Factor-Induced Clone B Subfamily and Pro-opiomelanocortin Gene in Lung Cancer Cell Lines. Am. J. Respir. Cell Mol. Biol. 1999, Vol. 20, pp1319-1325.	1-3,6-9, 16-22
Y	Taylor, M. Antisense oligonucleotides: a systematic high-throughput approach to target validation and gene function determination. DDT. 1999, Vol. 4, No. 12. pages 562-567, entire reference.	1-3, 6-9, 16-22.
Y	US 20020102572 (CROOKE et al) 01 August 2002 (01.08.2002), paragraph 0110.	1-3, 6-9, 16-22



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 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

15 June 2008 (15.06.2008)

Date of mailing of the international search report

07 AUG 2008

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Authorized officer

KIMBERLY CHONG

Telephone No. 571-272-1600



BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This International Searching Authority considers that the international application does not comply with the requirements of unity of invention (Rules 13.1, 13.2 and 13.3) for the reasons indicated below:

Groups 1-5, claim(s) 1-9 and 16-22, drawn to a method of identifying a molecule that inhibits cancer cells comprising introducing said molecule into cells wherein said molecule binds to a compound comprising SEQ ID NOs. 2, 1, 3, 4 or 5.

Group 6-10, claim(s) 10-15 and 23-26, drawn to a method of identifying a molecule that inhibits cancer cells comprising introducing said molecule into cells wherein said molecule binds to a compound comprising an amino acid sequence selected from the group consisting of SEQ ID Nos. 7, 6, 8, 9 and 10.

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.

The inventions listed as Groups 1-12 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.

The special technical feature of Groups 1-5, claims 1-9 and 16-22, is a molecule that binds to a compound having SEQ ID Nos 2, 1, 3, 4, 5.

The special technical feature of Groups 6-10, claims 10-15 and 23-26, is a molecule that binds to a compound having SEQ ID NOs. 7, 6, 8, 9 and 10.

Additionally, this international searching authority considers that the international application does not comply with the requirements of unity of invention (Rules 13.1, 13.2, and 13.3) for the reasons indicated below:

Groups 1-5 are drawn to a compound comprising SEQ ID NOs. 2, 1, 3, 4, 5.

Groups 6-10 are drawn to a compound comprising SEQ ID NOs. 7, 6, 8, 9 and 10.

According to the guidelines in Section (f)(i)(a) of Annex B of the PCT Administrative Instructions, the special technical feature as defined by PCT Rule 13.2 shall be considered to be met when all the alternatives of a Markush-group are of similar nature. For chemical alternatives, such as the claimed antisense sequences, the Markush group shall be regarded as being of similar nature when

(A) all alternatives have a common property or activity and

(B)(1) a common structure is present, i.e. a significant structure is shared by all of the alternatives or

(B)(2) in cases where the common structure cannot be the unifying criteria, all alternatives belong to an art recognized class of compounds in the art to which the invention pertains.

~~The instant sequences are considered to be each separate invention for the following reasons:~~

Form PCT/ISA/210 (extra sheet) (April 2007)

The sequences do not meet the criteria of (A), common property or activity or (B)(2), art recognized class of compounds. Although the sequence target and modulate expression of the same gene, each antisense sequence behaves in a different way in the context of the claimed invention. Each sequence is involved in binding to nuclear proteins differently in cancerous tissues.

Further, although the sequences target the same gene, the sequences do not meet the criteria of (B)(1), as they do not share, one with another, a common core structure. Accordingly, unity of invention between the sequences is lacking and each sequence claimed is considered to constitute a special technical feature.

As the nucleic acid sequences of the instant invention are recited in the first claimed invention, Applicants will obtain a search of the first sequence listed in the claims 1, 2, 3, 4, 5, and 16, 17, 18, 20. For every other sequence, applicants need to elect the sequence and pay an additional fee.

If the sequences are recited in the second or subsequent claimed invention, Applicants will need to elect the group and pay the fee to obtain a search of the first sequence listed in the claims encompassed by the second or subsequent group. For every other sequence in the second/subsequent group that applicants wish to have searched, applicants need to elect the sequence and pay an additional fee.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/23821

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.: 4,5,10-15 and 23-25
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:
Claims 4-5, 10-15 cannot be searched because the file does not contain a CRF. Claims 23-25 will not be searched because no fee has been paid for more than one group.
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.: 1-9, 16-22 and SEQ ID NO. 2
- 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.