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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: ALTERATION OF CELL MEMBRANE

(57) Abstract: Methods and compositions are provided for the persistent modification of cell membranes with exogenous proteins so as to alter the function of the cell to achieve effects similar to those of gene therapy, without the introduction of exogenous DNA. DNA sequences, the proteins and polypeptides embodying these sequences are disclosed for modulating the immune system. The modulations include down-regulation, up-regulation and apoptosis.



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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/20946

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 7 C12N5/00 C07K17/00 C12N15/12 C07K19/00 C07K14/36  
 C07K14/465 C07K14/495 C07K14/525 C07K14/54 C07K14/705  
 A61K35/14 A61K35/28 A61P37/00 A61P35/00 C12N5/06

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)

IPC 7 C12N

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 practical, search terms used)

BIOSIS, EPO-Internal, MEDLINE, PAJ, WPI 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 99 17801 A (DARLING DAVID ; FARZANEH FARZIN (GB); CANCER RES CAMPAIGN TECH (GB)) 15 April 1999 (1999-04-15)	1-6,9
A	abstract page 3, line 15 -page 10, line 4 ---	10-17
X	DARLING D ET AL: "In vitro immune modulation by antibodies coupled to tumour cells" GENE THERAPY, MACMILLAN PRESS LTD., BASINGSTOKE, GB, vol. 4, no. 12, 1 December 1997 (1997-12-01), pages 1350-1360, XP002097146 ISSN: 0969-7128 the whole document --- -/--	1-6,9



Further documents are listed in the continuation of box C.



Patent family members are listed in 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 document 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

20 June 2002

Date of mailing of the international search report

03/07/2002

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

International Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>CHEN A ET AL: "Hierarchical costimulator thresholds for distinct immune responses: application of a novel two-step Fc fusion protein transfer method."</p> <p>JOURNAL OF IMMUNOLOGY (BALTIMORE, MD.: 1950) UNITED STATES 15 JAN 2000, vol. 164, no. 2, 15 January 2000 (2000-01-15), pages 705-711, XP002202890 ISSN: 0022-1767 the whole document</p> <p>---</p>	1-3,5,6,9
X	<p>SANO T ET AL: "A STREPTAVIDIN-METALLOTHIONEIN CHIMERA THAT ALLOWS SPECIFIC LABELING OF BIOLOGICAL MATERIALS WITH MANY DIFFERENT HEAVY METAL IONS"</p> <p>PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE. WASHINGTON, US, vol. 89, March 1992 (1992-03), pages 1534-1538, XP002938748 ISSN: 0027-8424 the whole document</p> <p>---</p>	1-4
E	<p>WO 01 52664 A (SHIRWAN HAVAL ;UNIV LOUISVILLE RES FOUNDATION (US)) 26 July 2001 (2001-07-26) cited in the application the whole document</p> <p>-----</p>	1-20

## INTERNATIONAL SEARCH REPORT

international application No.  
PCT/US 01/20946

### Box I Observations where certain claims were found unsearchable (Continuation of item 1 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:  
see FURTHER INFORMATION sheet PCT/ISA/210
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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

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

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 fee, this Authority did not invite payment of any additional fee.
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.:

#### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Present claims 1 and 2 relate to a large number of possible surfaces to be modified. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of surfaces to be modified claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to the modification of cell surfaces as described in the examples.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/20946

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9917801	A	15-04-1999	AU	9276398 A	27-04-1999
			WO	9917801 A2	15-04-1999
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WO 0152664	A	26-07-2001	AU	3293301 A	31-07-2001
			WO	0152664 A1	26-07-2001
			AU	1676302 A	14-01-2002
			WO	0202751 A2	10-01-2002
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