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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
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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.*



**WO 2003/101482 A3**

(54) Title: LIPOSOME VACCINE FORMULATIONS FOR FIN-FISH

(57) Abstract: Liposome vaccine formulations for fin-fish are provided which comprise antigenic material derived from one or more fin-fish pathogen in association with liposomes, and optionally include other therapeutic compounds. The vaccines can be used for immunization and/or therapeutic treatment of fin-fish against infectious and parasitic diseases. The vaccines can result in reduced side effects, such as less adhesions and pigmentation, compared to oil-based vaccine formulations. The present invention also provides methods of preparing and storing the liposome vaccines and methods of administering the vaccine formulation to fin-fish.

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/CA 03/00768

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A61K39/39 A61P31/00

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 A61K

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)  
EPO-Internal, WPI Data, BIOSIS

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>NAKHLA A N ET AL: "Serum anti-LPS antibody production by rainbow trout (<i>Oncorhynchus mykiss</i>) in response to the administration of free and liposomally-incorporated LPS from <i>Aeromonas salmonicida</i>" FISH AND SHELLFISH IMMUNOLOGY, vol. 7, no. 6, 1997, pages 387-401, XP002261926 ISSN: 1050-4648 cited in the application the whole document</p> <p style="text-align: center;">---</p> <p style="text-align: center;">-/--</p>	1-24

Further documents are listed in the continuation of box C.       Patent family members are listed in annex.

° Special categories of cited documents :

<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*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)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p>	<p>*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</p> <p>*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</p> <p>*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.</p> <p>*&amp;* document member of the same patent family</p>
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Date of the actual completion of the international search	Date of mailing of the international search report
18 November 2003	03/12/2003

Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  <p style="text-align: center;">Teyssier, B</p>
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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/CA 03/00768

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NAKHLA A N ET AL: "Incorporation of the lipopolysaccharide and polysaccharide from <i>Aeromonas salmonicida</i> into liposomes" JOURNAL OF LIPOSOME RESEARCH, vol. 6, no. 1, 1996, pages 141-154, XP001160908 ISSN: 0898-2104 the whole document ---	1-24
X	NAKHLA A ET AL: "Uptake and biodistribution of free and liposomally incorporated lipopolysaccharide of <i>Aeromonas salmonicida</i> administered via different routes to rainbow trout ( <i>Oncorhynchus mykiss</i> )" JOURNAL OF LIPOSOME RESEARCH, vol. 4, no. 2, 1994, pages 1029-1048, XP000457304 ISSN: 0898-2104 cited in the application the whole document ---	1-24
X	POWER C A ET AL: "Uptake and tissue distribution of liposomes after intraperitoneal administration to rainbow trout, <i>Oncorhynchus mykiss</i> (Richardson): a preliminary report" JOURNAL OF FISH DISEASES, vol. 13, no. 4, 1990, pages 329-332, XP008024689 ISSN: 0140-7775 cited in the application the whole document ---	1-24
X	RODGERS C J: "Immersion vaccination for control of fish furunculosis" DISEASES OF AQUATIC ORGANISMS, vol. 8, no. 1, 6 March 1990 (1990-03-06), pages 69-72, XP008024690 ISSN: 0177-5103 cited in the application the whole document ---	1-24
X	WO 00 37100 A (KIMMINS WARWICK CHARLES ;POHAJDAK BILL (CA); BROWN ROBERT (CA); MA) 29 June 2000 (2000-06-29) page 13, line 17 - line 27 the whole document ---	1-24
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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/CA 03/00768

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

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FERNANDEZ-ALONSO M ET AL: "DNA vaccination by immersion and ultrasound to trout viral haemorrhagic septicaemia virus" VACCINE, vol. 19, no. 23-24, 30 April 2001 (2001-04-30), pages 3067-3075, XP004234177 ISSN: 0264-410X the whole document -----	1-24
P,X	ROMOEREN K ET AL: "Immersion delivery of plasmid DNA I. A study of the potentials of a liposomal delivery system in rainbow trout ( <i>Oncorhynchus mykiss</i> ) fry." JOURNAL OF CONTROLLED RELEASE, vol. 85, no. 1-3, 13 December 2002 (2002-12-13), pages 203-213, XP004397779 ISSN: 0168-3659 (ISSN print) the whole document -----	1-24
P,X	IRIE T ET AL: "Humoral immune response of carp ( <i>Cyprinus carpio</i> ) induced by oral immunization with liposome-entrapped antigen." DEVELOPMENTAL AND COMPARATIVE IMMUNOLOGY, vol. 27, no. 5, May 2003 (2003-05), pages 413-421, XP002261927 ISSN: 0145-305X the whole document -----	1-24

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/CA 03/00768

## 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:  
  
Although claims 23 and 24 are directed to a method of treatment of the animal body, the search has been carried out and based on the alleged effects of the composition.
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 1-16 relate to a formulation defined by reference to a desirable property, namely a minimum of 50% relative survival in fin fishes treated with the formulation (claim 1) or reduced side effects relative to oil-based formulations (claim 3). Because an attempt is made to define the formulation by reference to a result to be achieved, the claims lacks clarity (Article 6 PCT) to the extent that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been directed to liposome vaccine formulation for fishes, irrespective of the alledged effects.

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/CA 03/00768

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 0037100	A	29-06-2000	AU	1765300 A		12-07-2000
			CA	2356452 A1		29-06-2000
			WO	0037100 A2		29-06-2000
			EP	1140151 A2		10-10-2001

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