

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 August 2003 (07.08.2003)

PCT

(10) International Publication Number
WO 03/063902 A3

(51) International Patent Classification⁷: **A61K 41/00**,
31/7056

(21) International Application Number: PCT/US03/03358

(22) International Filing Date: 3 February 2003 (03.02.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/353,162 1 February 2002 (01.02.2002) US

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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, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE,
SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC,
VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI,
SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations 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, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
4 September 2003

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: INACTIVATION OF WEST NILE VIRUS AND PLASMODIUM FALCIPARUM USING ALLOXAZINE-DERIVATING PHOTOSENSITIZERS

(57) Abstract: Methods and apparatuses are provided for inactivation of parasites (Pl. falciparum) or virus (West Nile Virus) in fluids. Preferably the fluids contain blood or blood products and comprise biologically active proteins. Preferred methods include the steps of adding an effective, non-toxic amount of a photosensitizer (riboflavin) to a fluid and exposing the fluid to photoradiation sufficient to activate the photosensitizer whereby microorganisms are inactivated.



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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/03358

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61K41/00 A61K31/7056

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, PAJ, EMBASE, MEDLINE, BIOSIS, CHEM ABS 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 00 04930 A (COBE LAB) 3 February 2000 (2000-02-03) cited in the application see the claims figure 6	1-3, 5-15, 19, 20, 23-32
X	WO 01 28599 A (PLATZ MATTHEW STEWART ; GAMBRO INC (US); GOODRICH RAYMOND PAUL JR () 26 April 2001 (2001-04-26) cited in the application page 18, line 17-25 -page 19, line 1,2; claims 4,5,12-19	1, 16-18
X	WO 01 78792 A (AMERICAN NAT RED CROSS) 25 October 2001 (2001-10-25) page 7, line 7; claims 25-29	1, 2
	-/--	



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

3 July 2003

Date of mailing of the international search report

14/07/2003

Name and mailing address of the ISA

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Vadot, P

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/03358

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01 96340 A (GAMBRO INC) 20 December 2001 (2001-12-20) figures 32,33; example 43 ---	3,4
X	WO 94 28120 A (NEW YORK BLOOD CENTER INC) 8 December 1994 (1994-12-08) Page 18, last paragraph page 16, line 1 -page 23, line 12 ---	1,2,8
X	SOLIMAN ET AL.: "Application of an immunoperoxidase monolayer assay for the detection of arboviral antibodies" JOURNAL OF VIROLOGICAL METHODS, vol. 65, no. 2, 1997, pages 147-151, XP002242775 abstract ---	21,22
X	FRANCKI ET AL.: "Classification and nomenclature of viruses, Fifth report of the international committee on taxonomy of viruses, Archives of virology Supplementum 2", SPRINGER-VERLAG, WIEN NEW-YORK XP002242777 page 223 -page 226 ---	8,22
X	APPLEYARD: "Photosensitivity of Semliki forest and other viruses" JOURNAL OF GENERAL VIROLOGY, vol. 1, - 1967 pages 143-152, XP008018664 abstract -----	8,22

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/03358

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:

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:

see additional 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 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

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-7,9-21,23-32

A method/system for treating a fluid to inactivate a parasite.

A kit for testing the inactivation of the blood and the presence of a microorganism.

2. Claims: 1,3-32

A method/system for treating a fluid to inactivate a virus.

A kit for testing the inactivation of the blood and the presence of a microorganism (West Nile Virus).

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/US 03/03358

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0004930	A	03-02-2000	US 6258577 B1	10-07-2001
			AU 744978 B2	07-03-2002
			AU 5219899 A	14-02-2000
			BG 104362 A	30-04-2001
			BR 9906622 A	18-12-2001
			CA 2304696 A1	03-02-2000
			CN 1287496 T	14-03-2001
			EA 2655 B1	29-08-2002
			EE 200000172 A	16-04-2001
			EP 1047458 A2	02-11-2000
			HU 0004907 A2	28-05-2001
			NO 20001440 A	19-05-2000
			NZ 503474 A	25-10-2002
			NZ 521054 A	29-04-2003
			PL 340630 A1	12-02-2001
			SK 5832000 A3	18-01-2001
			TR 200001216 T1	21-03-2003
			WO 0004930 A2	03-02-2000
			US 2003073650 A1	17-04-2003
			US 6277337 B1	21-08-2001
ZA 200001357 A	17-10-2000			
WO 0128599	A	26-04-2001	US 6268120 B1	31-07-2001
			AU 7580700 A	30-04-2001
			CA 2387779 A1	26-04-2001
			EP 1221982 A1	17-07-2002
			JP 2003512340 T	02-04-2003
			WO 0128599 A1	26-04-2001
			US 2001024781 A1	27-09-2001
WO 0178792	A	25-10-2001	US 2001046662 A1	29-11-2001
			AU 5152601 A	30-10-2001
			WO 0178792 A1	25-10-2001
WO 0196340	A	20-12-2001	AU 6682901 A	24-12-2001
			CA 2381594 A1	20-12-2001
			EP 1289991 A1	12-03-2003
			WO 0196340 A1	20-12-2001
			US 2002015662 A1	07-02-2002
WO 9428120	A	08-12-1994	WO 9428120 A1	08-12-1994
			AU 696246 B2	03-09-1998
			AU 7048594 A	20-12-1994
			CA 2163636 A1	08-12-1994
			EP 0702719 A1	27-03-1996
			FI 955690 A	22-01-1996
			JP 11503601 T	30-03-1999
			KR 258377 B1	01-06-2000
			NO 954815 A	26-01-1996
			US 6087141 A	11-07-2000
			US 6077659 A	20-06-2000
			US 5658722 A	19-08-1997
			US 5981163 A	09-11-1999
			US 6541229 B1	01-04-2003
			US 5712086 A	27-01-1998
			US 6413714 B1	02-07-2002
			US 6214534 B1	10-04-2001
US 5789150 A	04-08-1998			

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/03358

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9428120	A	US 5858643 A	12-01-1999
		ZA 9403754 A	09-02-1995
