

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
25 November 2004 (25.11.2004)

PCT

(10) International Publication Number
WO 2004/101758 A3

(51) International Patent Classification⁷: A01N 1/00,
C12N 5/00, 5/02, 5/08

FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

(21) International Application Number:
PCT/US2004/014551

Declarations under Rule 4.17:

(22) International Filing Date: 7 May 2004 (07.05.2004)

— 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, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, 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, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, 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, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/469,200 9 May 2003 (09.05.2003) US

(71) Applicant (for all designated States except US):
LIFEBLOOD MEDICAL INC. [US/US]; 1 Iroquois Drive, Freehold, NJ 07728 (US).

(72) Inventors: FISCHER, Joseph; 1 Iroquois Drive, Freehold, NJ 07728 (US). BAKER, Jan; 170 S. 3rd Street, Dixon, CA 95620 (US). SHORR, Robert, G., L.; 28 Brookfall Road, Edison, NJ 08820 (US).

(74) Agents: MERCANTI, Michael, N. et al.; Muserlian, Lucas & Mercanti, LLP, 475 Park Avenue South, New York, NY 10016 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, 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, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, 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, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, 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, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,

(88) Date of publication of the international search report:
11 August 2005

[Continued on next page]

(54) Title: COMPOSITION FOR MAINTAINING ORGAN AND CELL VIABILITY

(57) Abstract: The present invention is directed to nanoparticle compositions for maintaining organ, tissue and cellular viability when such are separated from normal physiological supports. Compositions containing the nanoparticle compositions and methods of preserving organs such as kidneys, both *in vivo* and *ex vivo*, are also disclosed.

WO 2004/101758 A3



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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/14551

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(7) : A01N 1/00; C12N 5/00, 5/02, 5/08
 US CL : 1.1, 325, 371, 374, 383, 384, 389, 404, 405
 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. : 1.1, 325, 371, 374, 383, 384, 389, 404, 405

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)
 Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,303,375 B1 (KIMURA et al) 16 October 2001 (16.10.2001), column 8, lines 50-67, column 9, lines 1-5, 10-12, 26-31.	1-25
Y	US 5,658,575 A (RIBIER et al) 19 August 1997 (19.08.1997), column 3, lines 61-65, column 5, lines 20-49.	1-25
Y	US 5,232,848 A (WOLFE et al) 3 August 1993 (03.08.1993), abstract, column 16, lines 60-69, column 17, lines 1-64.	11
Y	US 4,657,866 (KUMAR) 14 April 1987 (14.04.1987), abstract, column 1, lines 60-69, column 2, lines 1-69.	12
Y	US 5,405,742 A (TAYLOR) 11 April 1995 (11.04.1995), abstract, column 3, lines 45-46, column 11, lines 48-49, column 14, lines 55-57, column 20, lines 57-68, column 21, lines 1-20.	12
Y	US 6,153,582 A (SKELNIK) 28 November 2000 (28.11.2000), abstract, column 3, lines 56-67, column 4, lines 5, 14-22, 37, 54, column 21, lines 19-65.	12, 13, 15
Y	US 5,474,931 A (DISORBO et al) 12 December 1995 (12.12.1995), abstract, column 9, lines 15-16, column 10, lines 25-28, 39-40, column 12, lines 38-40.	14
Y	US 2002/0012988 A1 (BRASILE) 31 January 2002 (31.01.2002), abstract, pages 5 and 6, paragraph [0051].	14

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	"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
"E"	earlier application or patent published on or after the international filing date	"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
"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)	"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
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search: 01 May 2005 (01.05.2005)
 Date of mailing of the international search report: 08 JUN 2005

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) 273-0419
 Authorized officer: Susan E. Fernandez (Signature: Maria J. White)
 Telephone No. (571) 272-1600

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/14551

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,416,740 B1 (UNGER) 9 July 2002 (09.07.2002), abstract, column 13, lines 21-67, column 14, lines 1-17, 54-56, column 16, lines 11-15, column 23, lines 39-40, 55, 65, column 24, lines 11-12, column 32, lines 12, 26, 58-60, column 33, line 53, 62, column 84, line 50.	16, 22
Y	US 5,712,163 A (PARENTEAU et al) 27 January 1998 (27.01.1998), abstract, column 5, lines 31, 50-51.	16
Y	US 2002/0090369 A1 (MURPHY et al) 11 July 2002 (11.07.2002), page 13, paragraph [0089], page 16, paragraphs [0117], [0118], page 17, paragraph [0122].	16, 18
Y	US 2002/0119567 A1 (CHIARELLO et al) 29 August 2002 (29.08.2002), abstract, page 2, paragraphs [0015], [0016], page 3, paragraphs [0023], [0024], page 4, paragraph [0031], page 5, paragraph [0035], page 6, paragraph [0047].	17
Y	US 5,104,787 A (LINDSTROM et al) 14 April 1992 (14.04.1992), abstract, column 5, lines 30-67, column 6, lines 30-67, column 7, lines 1-27, column 8, lines 1-27.	17, 19
Y	US 6,372,494 B1 (NAUGHTON et al) 16 April 2002 (16.04.2002), column 29, lines 51-62.	17
Y	US 5,221,668 A (HENNINGFIELD et al) 22 July 1993 (22.07.1993), column 3, lines 43-67, column 4, lines 43-67, column 5, lines 1-23, column 6, lines 1-23.	17
Y	US 5,468,635 A (KOMIYA et al) 21 November 1995 (21.11.1995), abstract, column 5, lines 43-67, column 6, lines 1-25.	20
Y	US 5,599,659 A (BRASILE et al) 4 February 1997 (04.02.1997), column 11, lines 30-37, column 12, lines 1-67.	21
Y	US 4,533,637 (YAMANE et al) 6 August 1985 (06.08.1985), abstract, column 7, lines 10-63.	21
Y	EP 0 076 647 A2 (STEIMER) 13 April 1983 (13.04.1983), abstract, page 21, lines 1-20.	22
Y	US 6,406,909 B1 (SHIBUYA et al) 18 June 2002 (18.06.2002), abstract, column 14, lines 30-32.	22
Y	US 4,761,288 (MEZEI) 2 August 1988 (02.08.1988), abstract, column 7, lines 60-67, column 8, lines 1-8.	22

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/14551

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.: 26-32
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:
The claims were misnumbered. There were duplicate claims (claims 26 and 27).

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:

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.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/14551

Continuation of B. FIELDS SEARCHED Item 3:
EAST (US-PGPUB, USPAT, EPO, JPO, DERWENT), BIOSIS, CAPLUS
search terms: nanoparticles, liposomes, heme, organ transplants, viability, preservation, growth factors, media ingredients