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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
5 February 2009 (05.02.2009)

PCT

(10) International Publication Number
WO 2009/016518 A3

(51) International Patent Classification:
A61L 31/12 (2006.01) *C12N 5/00* (2006.01)
A61L 27/48 (2006.01) *C12N 5/06* (2006.01)

(21) International Application Number:
PCT/IB2008/002894

(22) International Filing Date:
30 July 2008 (30.07.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/881,839 30 July 2007 (30.07.2007) US

(71) Applicant *(for all designated States except US)*: **SOFRADIM PRODUCTION** [FR/FR]; 116, avenue du Formans, F-01600 Trévoux (FR).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **BAYON, Yves** [FR/FR]; 62 Rue du repos, F-69007 Lyon (FR). **GRAVAGNA, Philippe** [FR/FR]; 23, Grande-Rue, F-69540 Irigny (FR). **MENEGHIN, Alfredo** [FR/FR]; 21, quai Arloing, F-69009 Lyon (FR). **THERIN, Michel** [FR/FR]; 19 grande rue de la Croix Rousse, F-69004 CROIX ROUSSE (FR). **LEFRANC, Olivier** [FR/FR]; Résidence Champ Fleuri, Rue des Lauriers, F-01400 Chatillon sur Chalaronne (FR).

(74) Agent: **CABINET GERMAIN & MAUREAU**; BP 6153, F-69466 Lyon Cedex 06 (FR).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(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, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
7 January 2010

WO 2009/016518 A3

(54) Title: BIOLOGICAL MESH TISSUE ENGINEERING SUPPORT

(57) Abstract: Cell cultures or tissue engineering supports, include at least a porous matrix based on a collagen sponge which defines first pores and a porous three- dimensional knit which defines second pores, the porous matrix filling the three- dimensional knit and all the first and second pores being at least partially interconnected with one another.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2008/002894

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61L31/12 A61L27/48 C12N5/00 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)
A61L 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)
EPO-Internal, 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	EP 1 273 312 A (NAT INST OF ADVANCED IND SCIEN [JP]) 8 January 2003 (2003-01-08) paragraphs [0008] - [0013] paragraphs [0015] - [0030], [0035], [0041], [0042], [0044], [0055] examples 1-3	1-3,9, 10, 13-15, 17-22, 24,25, 32-34, 36,37, 39,40
Y	----- -/--	1-45

[X] Further documents are listed in the continuation of Box C.

[X] 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 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	Date of mailing of the international search report
11 November 2009	23/11/2009

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Lamers, Wolfram

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2008/002894

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 2006/138098 A (ETHICON INC [US]; YANG CHUNLIN [US]; HAMMER JOSEPH [US]; WANG ZIWEI [U) 28 December 2006 (2006-12-28) page 3, line 27 - page 7, line 13 claims 1-3,5-7,10,13,14	1-3, 9-11,15, 17-20, 24,25, 32-37
Y		1-45
X	DATABASE EPODOC [Online] EUROPEAN PATENT OFFICE, THE HAGUE, NL; XP002554917 abstract & JP 11 319068 A 24 November 1999 (1999-11-24)	1-3,9, 10,15, 17,18, 25, 32-34, 36,37
X	EP 1 535 631 A (ETHICON INC [US]) 1 June 2005 (2005-06-01) paragraphs [0009], [0011] page 3, lines 50,51 paragraphs [0015], [0016], [0018] - [0022], [0034] - [0037], [0048], [0060] examples 1,2	1-3,9, 10,13, 15, 17-20, 25-37
Y	US 2007/032805 A1 (THERIN MICHEL [FR] ET AL) 8 February 2007 (2007-02-08) paragraphs [0001], [0026] - [0028], [0032] - [0037], [0048] - [0057], [0061] - [0067], [0073], [0074], [0078], [0084]	9-24,32, 33
Y	US 6 443 964 B1 (ORY FRANCOIS REGIS [FR] ET AL) 3 September 2002 (2002-09-03) the whole document	9-31
Y	& EP 0 999 805 A 17 May 2000 (2000-05-17) cited in the application	9-31
Y	US 6 451 032 B1 (ORY FRANCOIS REGIS [FR] ET AL) 17 September 2002 (2002-09-17) column 3, lines 12-58 column 4, lines 48-55 column 6, lines 40-59	36-38
Y	US 6 391 939 B2 (TAYOT JEAN-LOUIS [FR] ET AL) 21 May 2002 (2002-05-21) column 4, line 5 - column 6, line 3	36-38
Y	US 2004/132365 A1 (THERIN MICHEL [FR] ET AL) 8 July 2004 (2004-07-08) columns 29-35	4-8

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2008/002894

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1273312 A	08-01-2003	DE 60214477 T2	19-04-2007
		JP 3646162 B2	11-05-2005
		JP 2003010309 A	14-01-2003
		US 2003012805 A1	16-01-2003
WO 2006138098 A	28-12-2006	EP 1896056 A1	12-03-2008
		US 2006286144 A1	21-12-2006
JP 11319068 A	24-11-1999	NONE	
EP 1535631 A	01-06-2005	AU 2004231222 A1	09-06-2005
		CA 2488466 A1	25-05-2005
		CN 1621016 A	01-06-2005
		JP 2005169103 A	30-06-2005
US 2007032805 A1	08-02-2007	NONE	
US 6443964 B1	03-09-2002	AT 204444 T	15-09-2001
		AU 8866998 A	22-02-1999
		DE 69801445 D1	27-09-2001
		DE 69801445 T2	06-12-2001
		EP 0999805 A1	17-05-2000
		ES 2163884 T3	01-02-2002
		FR 2766698 A1	05-02-1999
		WO 9905990 A1	11-02-1999
		JP 2003517318 T	27-05-2003
EP 0999805 A	17-05-2000	AT 204444 T	15-09-2001
		AU 8866998 A	22-02-1999
		DE 69801445 D1	27-09-2001
		DE 69801445 T2	06-12-2001
		ES 2163884 T3	01-02-2002
		FR 2766698 A1	05-02-1999
		WO 9905990 A1	11-02-1999
		JP 2003517318 T	27-05-2003
		US 6443964 B1	03-09-2002
US 6451032 B1	17-09-2002	AT 213959 T	15-03-2002
		AU 729116 B2	25-01-2001
		AU 8867098 A	22-02-1999
		BR 9811063 A	19-09-2000
		CA 2299524 A1	11-02-1999
		DE 69804104 D1	11-04-2002
		DE 69804104 T2	28-11-2002
		EP 0998314 A1	10-05-2000
		ES 2174472 T3	01-11-2002
		FR 2766717 A1	05-02-1999
		WO 9906080 A1	11-02-1999
		JP 2001511398 T	14-08-2001
US 6391939 B2	21-05-2002	AT 216897 T	15-05-2002
		AU 6298498 A	26-08-1998
		CA 2278662 A1	13-08-1998
		DE 69805166 D1	06-06-2002
		DE 69805166 T2	02-10-2002
		EP 0964709 A1	22-12-1999
		ES 2174419 T3	01-11-2002
		FR 2759084 A1	07-08-1998

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2008/002894

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6391939 B2		WO 9834656 A1	13-08-1998
		JP 3231793 B2	26-11-2001
		JP 2000509632 T	02-08-2000
		US 2001008930 A1	19-07-2001
US 2004132365 A1	08-07-2004	NONE	