



(51) International Patent Classification:

C12M 1/32 (2006.01) C12M 1/34 (2006.01)  
C12M 1/12 (2006.01) B01L 3/00 (2006.01)  
C12M 1/00 (2006.01) G01N 21/64 (2006.01)

(72) Inventors: MCGARR, Paul; 54 Eastland Road, Longmeadow, MA 01106 (US). NEILSON, Andy, C.; 30 West Hill Road, Sunapee, NH 03782 (US). TEICH, Jay, S.; 220 Sawyer Hill Road, Berlin, MA 01503 (US).

(21) International Application Number:

PCT/US2013/069839

(74) Agents: US, Natasha, C. et al.; Goodwin Procter LLP, Exchange Place, Boston, MA 02109 (US).

(22) International Filing Date:

13 November 2013 (13.11.2013)

(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, BN, BR, BW, BY, BZ, CA, CH, CL, 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, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/725,781 13 November 2012 (13.11.2012) US

(71) Applicant: SEAHORSE BIOSCIENCE [US/US];

Seahorse Bioscience, 16 Esquire Road, Billerica, MA 01862 (US).

[Continued on next page]

(54) Title: APPARATUS AND METHODS FOR THREE-DIMENSIONAL TISSUE MEASUREMENTS BASED ON CONTROLLED MEDIA FLOW

(57) Abstract: An apparatus including a plurality of wells for conducting analysis of three-dimensional cell samples (e.g., tissue samples) and methods for experimenting with a three-dimensional sample. A removable insert for use with the apparatus enables plunger-driven perfusion of the three-dimensional sample.

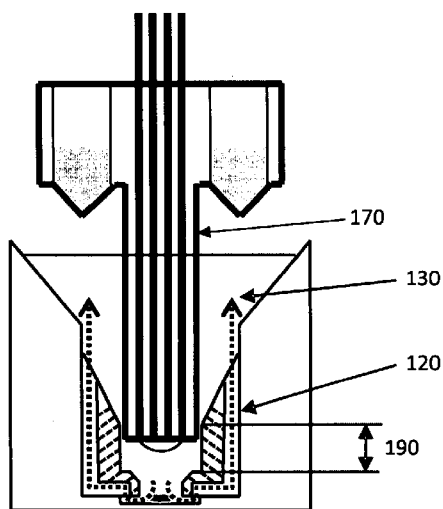


Figure 1b



**(84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, 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:**

17 July 2014

INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2013/069839

A. CLASSIFICATION OF SUBJECT MATTER  
 INV. C12M1/32 C12M1/12 C12M1/00 C12M1/34 B01L3/00  
 G01N21/64  
 ADD.  
 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)  
 C12M B01L G01N

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)  
 EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008/014571 A1 (TEICH ET AL.) 17 January 2008 (2008-01-17) cited in the application the whole document	1-37
A	US 2002/182720 A1 (GEVAERT ET AL.) 5 December 2002 (2002-12-05) paragraphs [0003], [0008], [0011], [0031], [0037]; figures 5, 8	1,21,23, 24
A	US 5 278 048 A (PARCE ET AL.) 11 January 1994 (1994-01-11) column 4, line 63 - column 5, line 2; figure 2	1,21,23, 24
A	US 2005/054028 A1 (TEICH ET AL.) 10 March 2005 (2005-03-10) paragraphs [0085] - [0090]; figures 1, 2	1,21,23, 24
	-/--	

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 but 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  8 May 2014	Date of mailing of the international search report  03/06/2014
---	--

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

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2013/069839

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2001/039045 A1 (CHAN ET AL.) 8 November 2001 (2001-11-08) paragraphs [0002], [0014], [0017], [0023]; figures 1, 4 -----	1,21,23, 24
A	US 5 468 605 A (HARRIS ET AL.) 21 November 1995 (1995-11-21) column 4, line 34 - line 44; figure 2 -----	1,21,23, 24
A	US 2007/087401 A1 (NEILSON ET AL.) 19 April 2007 (2007-04-19) the whole document -----	1,21,23, 24

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/069839

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008014571	A1	17-01-2008	CN 101506643 A
			EP 2041551 A2
			US 2008014571 A1
			WO 2008008149 A2
-----			
US 2002182720	A1	05-12-2002	NONE
-----			
US 5278048	A	11-01-1994	NONE
-----			
US 2005054028	A1	10-03-2005	EP 1664740 A2
			EP 2322913 A2
			JP 2007505316 A
			US 2005054028 A1
			US 2007238165 A1
			US 2010105578 A1
			US 2010227385 A1
			WO 2005026701 A2
-----			
US 2001039045	A1	08-11-2001	AT 412732 T
			CA 2400164 A1
			EP 1268742 A2
			JP 2003528637 A
			KR 20030001391 A
			US 2001039045 A1
			WO 0172954 A2
-----			
US 5468605	A	21-11-1995	NONE
-----			
US 2007087401	A1	19-04-2007	NONE
-----			