

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 December 2007 (27.12.2007)

PCT

(10) International Publication Number
WO 2007/149791 A3

(51) International Patent Classification:
C12M 1/00 (2006.01) *C12Q 1/68* (2006.01)

(21) International Application Number:
PCT/US2007/071402

(22) International Filing Date: 15 June 2007 (15.06.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/814,622 15 June 2006 (15.06.2006) US

(71) Applicant (for all designated States except US): **STRATAGENE** [US/US]; 11011 North Torrey Pines Road, La Jolla, CA 92037 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BRAMAN, Jeffrey, C.** [US/US]; 7875 Vista Higuera, Carlsbad, CA 92009 (US). **BASEHORE, Lee, Scott** [US/US]; 11147 Oak Creek Drive, Lakeside, CA 92040 (US). **NOVORADOVSKAYA, Natalia** [US/US]; 12568 Camerero Court, San Diego, CA 92130 (US).

(74) Agent: **LATIMER, Matthew, T.**; Latimer, Mayberry & Matthews IP Law LLP, 13873 Park Center Road, Suite 106, Herndon, VA 20171 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, 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, 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, HU, IE, IS, IT, LT, LU, LV, MC, MT, 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).

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:
27 November 2008

(54) Title: SYSTEM FOR ISOLATING BIOMOLECULES FROM A SAMPLE

(57) Abstract: The present invention provides an automated system for purification of a substance of interest. The system generally comprises an instrument for moving fluids through the system, a reagent pack for storing fluids, and a purification cartridge. The cartridge comprises two filtration units for binding substances based on different physical properties. The cartridge also comprises rotary valves for control of movement of fluids on the cartridge. In preferred embodiments, the system is useful for purifying RNA from blood samples.



WO 2007/149791 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/71402

A. CLASSIFICATION OF SUBJECT MATTER

IPC: C12M 1/00(2006.01);C12Q 1/68(2006.01)

USPC: 435/283.1,6

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. : 435/283.1, 6

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)
EAST, PUBMED, SCIENCE DIRECT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	U.S. 6,374,684 B1 (DORITY) 23 May 2002 (23.05.2002), fig. 10-12.	1-7
X	U.S. 6,663,833 B1 (STAVE et al.) 16 December 2003 (16.12.2003), fig. 1.	1-7
A	U.S. 6,813,568 B2 (POWELL et al.) 02 November 2004 (02.11.2004).	1-7
A	U.S. 6,748,975 B2 (HARTSHORNE et al.) 15 June 2004 (15.06.2004).	1-7
A	U.S. 6,168,948 B1 (ANDERSON et al.) 02 January 2001 (02.01.01).	1-7

☐ 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	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search

17 September 2008 (17.09.2008)

Date of mailing of the international search report

29 SEP 2008

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) 273-3201

Authorized officer

CHRISTOPHER M. BABIC/

Telephone No. 571-272-1600

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/71402

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.:
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 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:
Please See Continuation 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 additional fees, this Authority did not invite payment of any additional fees.
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.: 1-7

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US07/71402

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-7, drawn to a device for purification of a substance of interest.

Group II, claim(s) 8-11, drawn to a device for filtering blood cells from a sample.

Group III, claim(s) 12-18, drawn to a system for purifying a substance of interest.

Group IV, claim(s) 19-24, drawn to a automated method for the isolation of a nucleic acid of interest by means of the mechanical displacement of liquids.

The inventions listed as groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

A system for purifying a substance of interest, said system comprising: an instrument for moving fluids through the system; a reagent pack for storing fluids for movement through the system; and a purification cartridge for purifying the substance of interest, wherein the purification cartridge comprises two or more valves that are controlled by a component of the system was known in the art at the time of invention (U.S. 5,047,524; fig. 1, col. 10-11; Andrus teaches a system comprising a purification cartridges connected with two valves, for example). The said product cannot therefore be considered a special technical feature, as lack of unity rules hold that a feature known to a person of ordinary skill in the art makes no advance over the prior art.