



(51) International Patent Classification:

B01J 19/00 (2006.01) C40B 50/14 (2006.01)
C12N 15/10 (2006.01) C40B 60/12 (2006.01)
C40B 40/08 (2006.01)

(21) International Application Number:

PCT/US2012/061702

(22) International Filing Date:

24 October 2012 (24.10.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/551,128 25 October 2011 (25.10.2011) US

(71) Applicant: ARIZONA BOARD OF REGENTS, a body corporate of the state of arizona, acting for and on behalf of ARIZONA STATE UNIVERSITY [US/US]; 1475 N. Scottsdale Road, Suite 200, Scottsdale, AZ 85257 (US).

(72) Inventors: WIKTOR, Peter; 3902 E. Bronco Trail, Phoenix, AZ 85044 (US). LABAER, Joshua; 5360 S. Miller Place, Chandler, AZ 85249 (US). KAHN, Peter;

2702 E. Verbena Drive, Phoenix, AZ 85048 (US). TAKU-LAPALLI, Bharath; 4901 S. Calle Los Cerros #151, Tempe, AZ 85282 (US). QIU, Ji; 492 West Carob Drive, Chandler, AZ 85248 (US). BRUNNER, Al; 15432 S. 1st Avenue, Phoenix, AZ 85245 (US). MAGEE, Mitch; 2973 W. Comstock Drive, Chandler, AZ 85224 (US).

(74) Agent: HARPER, David, S.; McDonnell Boehnen Hulbert & Berghoff LLP, 300 South Wacker Drive, Suite 3100, Chicago, IL 60606 (US).

(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, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: PROGRAMMABLE ARRAYS

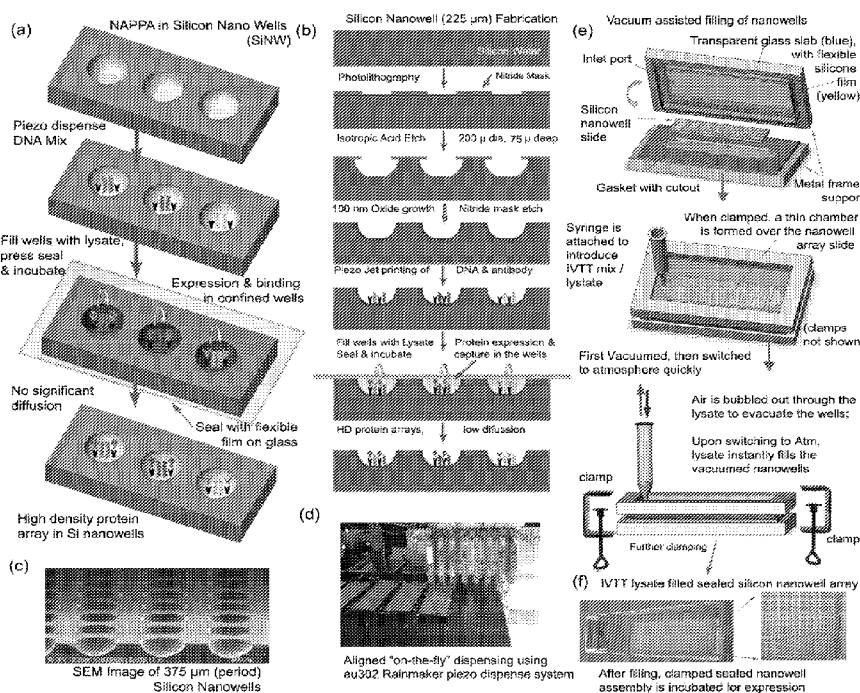


Figure 25

(57) Abstract: Biomolecule arrays on a substrate are described which contain a plurality of biomolecules, such as coding nucleic acids and/or isolated polypeptides, at a plurality of discrete, isolated, locations. The arrays can be used, for example, in high throughput genomics and proteomics for specific uses including, but not limited molecular diagnostics for early detection, diagnosis, treatment, prognosis, monitoring clinical response, and protein crystallography.

WO 2013/063126 A3



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, ML, MR, NE, SN, TD, TG).

Published:

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

(88) Date of publication of the international search report:

11 July 2013

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/061702

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B01J19/00 C12N15/10
 ADD. C40B40/08 C40B50/14 C40B60/12

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)
 B01J C12N C40B

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, 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	T. KINPARA: "A Picoliter Chamber Array for Cell-Free Protein Synthesis", JOURNAL OF BIOCHEMISTRY, vol. 136, no. 2, 1 August 2004 (2004-08-01), pages 149-154, XP055052994, ISSN: 0021-924X, DOI: 10.1093/jb/mvh102 cited in the application the whole document	1-14,21, 22
X	US 2005/260653 A1 (LABAER JOSHUA [US] ET AL) 24 November 2005 (2005-11-24) paragraph [0411]; claims; figures; examples ----- -/--	1-14

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
 "E" earlier application or patent 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 14 February 2013	Date of mailing of the international search report 19/04/2013
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 Veefkind, Victor

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/061702

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ANGENENDT P ET AL: "CELL-FREE PROTEIN EXPRESSION AND FUNCTIONAL ASSAY IN NANOWELL CHIP FORMAT", ANALYTICAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY, US, vol. 76, no. 7, 1 April 2004 (2004-04-01), pages 1844-1849, XP001196723, ISSN: 0003-2700, DOI: 10.1021/AC035114I cited in the application the whole document -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/061702

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:

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 fees, this Authority did not invite payment of 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.:

1-14, 21, 22(all partially)

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-14, 21, 22(all partially)

Biomolecule array, insofar relating to isolated coding nucleic acids

2. claims: 1-14, 21, 22(all partially)

Biomolecule array, insofar relating to isolated polypeptides

3. claims: 15-20(completely); 21, 22(partially)

An array

4. claims: 23(completely); 30-36(partially)

Method for in-situ nucleic acid expression

5. claims: 24-29(completely); 30-36(partially)

Method for expressing and capturing a product

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/061702

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005260653	A1	24-11-2005	
		AU 2005241003 A1	17-11-2005
		CA 2563168 A1	17-11-2005
		EP 1737982 A2	03-01-2007
		US 2005260653 A1	24-11-2005
		WO 2005108615 A2	17-11-2005
