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(21) International Application Number: PCT/US99/15969 (22) International Filing Date: 14 July 1999 (14.07.99) (30) Priority Data: 09/115,397 14 July 1998 (14.07.98) US (71) Applicant: ZYOMYX, INC. [US/US]; 3912 Trust Way, Hayward, CA 94545 (US). (72) Inventors: WAGNER, Peter; 2211 Village Court #7, Belmont, CA 94002 (US). AULT-RICHE, Dana; 972 Cajon Way, Palo Alto, CA 94303 (US). NOCK, Steffen; 3629 Glenwood Avenue, Redwood City, CA 94062 (US). ITIN, Christian; 315 Waverley Street #3, Menlo Park, CA 94025 (US). (74) Agents: CHOW, Y., Ping et al.; Heller Ehrman White & McAuliffe, 525 University Avenue, Palo Alto, CA 94301-1900 (US).		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> (88) Date of publication of the international search report: 4 May 2000 (04.05.00)	
(54) Title: MICRODEVICES FOR SCREENING BIOMOLECULES			
(57) Abstract			
<p>Methods and devices for the parallel, <i>in vitro</i> screening of biomolecular activity using miniaturized microfabricated devices are provided. The biomolecules immobilized on the surface of the devices of the present invention include proteins, polypeptides, polynucleotides, polysaccharides, phospholipids, and related unnatural polymers of biological relevance. These devices are useful in drug development, functional proteomics and clinical diagnostics and are preferably used for the parallel screening of families of related proteins.</p>			

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/15969

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G01N33/543 C12Q1/68

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)
IPC 7 G01N C12Q

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 596 421 A (HOFFMANN LA ROCHE) 11 May 1994 (1994-05-11) claims column 3, line 18 - line 34 column 6, line 52 - column 7, line 19 column 9, line 50 - line 39 ---	1-44
P,X	WO 98 50773 A (UNIV MINNESOTA) 12 November 1998 (1998-11-12) claims page 8, line 30 - page 9, line 11 page 11, line 25 - page 13, line 23 --- -/--	1-44

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Z document member of the same patent family

Date of the actual completion of the international search

26 November 1999

Date of mailing of the international search report

03.03.2000

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 98 43086 A (KIMBERLY CLARK CO) 1 October 1998 (1998-10-01) claims 1,9,11-20 figures 1,7 page 10, line 12 -page 11, line 2 page 15, line 27 -page 16, line 17 page 19, line 4 - line 30 page 24, line 9 -page 25, line 23 ---	1-44
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X	WO 98 23948 A (UNIV LELAND STANFORD JUNIOR) 4 June 1998 (1998-06-04) claims page 4, line 5 -page 5, line 5 page 11, line 8 - line 19 figures 1,4 ---	1-44
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X	US 5 776 674 A (ULMER KEVIN M) 7 July 1998 (1998-07-07) claims 9-15 column 4, line 30 - line 41 ---	1-44
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International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 445 934 A (FODOR STEPHEN P A ET AL) 29 August 1995 (1995-08-29) cited in the application claims column 11, line 12 - line 63 figure 1 ---	1-44
X	US 5 412 087 A (FODOR STEPHEN P A ET AL) 2 May 1995 (1995-05-02) cited in the application claims column 6, line 1 -column 7, line 2 column 10, line 1 - line 62 -----	1-44

INTERNATIONAL SEARCH REPORT

Inter. application No.
PCT/US 99/15969

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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.:

1-44

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/US 99/15969

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-44

Device having a number of non-contiguous reactive sites each comprising a substrate, organic thin film chemisorbed or physisorbed on a portion of the substrate and a biological moiety immobilized on said organic thin film wherein each of said sites independently react with a component of the sample and is separated from other sites by a region free of organic thin film. Methods for screening and detecting using said device.

2. Claim : 45

Device having a substrate, plurality of parallel microchannels in said substrate and a biological moiety immobilized within at least one of said microchannels and which interacts with a component of the sample fluid

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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