

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 March 2002 (07.03.2002)

PCT

(10) International Publication Number
WO 02/018949 A3

(51) International Patent Classification⁷: **B01J 19/00**,
G01N 33/543

(21) International Application Number: PCT/US01/25775

(22) International Filing Date: 17 August 2001 (17.08.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/652,873 31 August 2000 (31.08.2000) US

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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, 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, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

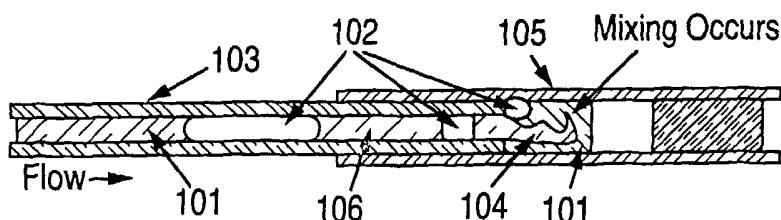
Published:

— with international search report

(88) Date of publication of the international search report:
16 January 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CAPILLARY ARRAY AND RELATED METHODS



(57) Abstract: The invention provides methods and devices for detecting the presence of one or more target analytes in a sample employing a channel having affixed therein one or more binding partners for each target analyte. Assays are carried out by transporting the sample through the channel to each successive binding partner so that target analyte present in said sample

binds to the corresponding binding partner. The sample is then transported beyond the binding partner(s), followed by detection of any target analyte bound to each binding partner. In one embodiment, binding efficiency is increased by the use of segmented transport, wherein a first bolus or bubble of a fluid that is immiscible with the sample precedes the sample during transport and a second bolus or bubble of a fluid that is immiscible with the sample follows the sample. Many configurations are possible for the device of the invention. A preferred device includes: a substrate with a channel formed in its surface, and a cover element that overlies and seals the channel. Binding partner(s) are affixed to the surface of the cover element facing the channel lumen.

INTERNATIONAL SEARCH REPORT

Int nal Application No
PCT/US 01/25775

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B01J19/00 G01N33/543

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 B01J 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 practical, 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.
X	WO 99 42809 A (OBERHARDT BRUCE J ;SANGUINEX (US)) 26 August 1999 (1999-08-26)	1-9, 11-25
A	page 29, line 13 -page 36, line 9 page 19, line 24 - line 29 ---	10,26-67
Y	WO 98 43739 A (BIOSITE DIAGNOSTICS INC) 8 October 1998 (1998-10-08)	1-9, 11-25
A	page 7, line 7 - line 13; claim 1 page 12, line 34 -page 13, line 7 ---	10,26-67
Y	EP 0 969 083 A (OLYMPUS OPTICAL CO) 5 January 2000 (2000-01-05)	1-9, 11-25
A	abstract column 5, line 34 -column 6, line 22 --- -/--	10,26-67



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

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- *Z* document member of the same patent family

Date of the actual completion of the international search

13 September 2002

Date of mailing of the international search report

07/10/2002

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/25775

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 5 952 173 A (SCHAPIRA THOMAS G ET AL) 14 September 1999 (1999-09-14) column 2, line 39 - line 57 column 9, line 52 - line 66 ----	1-9, 11-25 10,26-67
Y A	US 4 253 846 A (SMYTHE WILLIAM J ET AL) 3 March 1981 (1981-03-03) abstract the whole document column 2, line 29 - line 64 ----	1-9, 11-25 68-70
Y A	GB 1 231 482 A () 12 May 1971 (1971-05-12) page 1, line 55 - line 78; claims 1,2 the whole document ----	1-9, 11-25 68-70
A	US 4 853 336 A (SAROS STEPHEN ET AL) 1 August 1989 (1989-08-01) the whole document -----	68-70

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 01/25775

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9942809	A	26-08-1999	AU 2869599 A EP 1057004 A1 WO 9942809 A1 US 2002028471 A1	06-09-1999 06-12-2000 26-08-1999 07-03-2002
WO 9843739	A	08-10-1998	US 6156270 A AU 6579098 A EP 1019193 A2 JP 2001526778 T WO 9843739 A2 US 6271040 B1 US 2002086436 A1	05-12-2000 22-10-1998 19-07-2000 18-12-2001 08-10-1998 07-08-2001 04-07-2002
EP 0969083	A	05-01-2000	JP 11075812 A EP 0969083 A1 WO 9911754 A1 US 2002013457 A1	23-03-1999 05-01-2000 11-03-1999 31-01-2002
US 5952173	A	14-09-1999	US 5707799 A CA 2195875 A1 EP 0783694 A1 JP 10506991 T WO 9610747 A1	13-01-1998 11-04-1996 16-07-1997 07-07-1998 11-04-1996
US 4253846	A	03-03-1981	AU 529407 B2 AU 6415380 A BE 886132 A1 CA 1139125 A1 CH 654416 A5 DE 3042915 A1 FR 2470385 A1 GB 2064114 A ,B IT 1134355 B JP 1606769 C JP 2030471 B JP 56124052 A NL 8005809 A SE 465390 B SE 8007044 A	02-06-1983 28-05-1981 13-05-1981 11-01-1983 14-02-1986 03-09-1981 29-05-1981 10-06-1981 13-08-1986 13-06-1991 06-07-1990 29-09-1981 16-06-1981 02-09-1991 22-05-1981
GB 1231482	A	12-05-1971	BE 715042 A CH 509584 A DE 1773391 A1 FR 1584528 A JP 52044234 B SE 355415 B US 3479141 A	13-11-1968 30-06-1971 26-08-1971 26-12-1969 05-11-1977 16-04-1973 18-11-1969
US 4853336	A	01-08-1989	AU 577266 B2 AU 2116883 A CA 1238900 A1 DE 3375324 D1 DE 3381988 D1 DK 519583 A ,B, EP 0109278 A1 EP 0200235 A2 ES 527265 D0 ES 8505483 A1	22-09-1988 24-05-1984 05-07-1988 18-02-1988 13-12-1990 16-05-1984 23-05-1984 05-11-1986 16-05-1985 01-09-1985

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/25775

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4853336	A	HK 55388 A	29-07-1988
		JP 1748520 C	08-04-1993
		JP 4037952 B	22-06-1992
		JP 59102163 A	13-06-1984
		NO 834147 A ,B,	16-05-1984
		ZA 8308322 A	27-06-1984
