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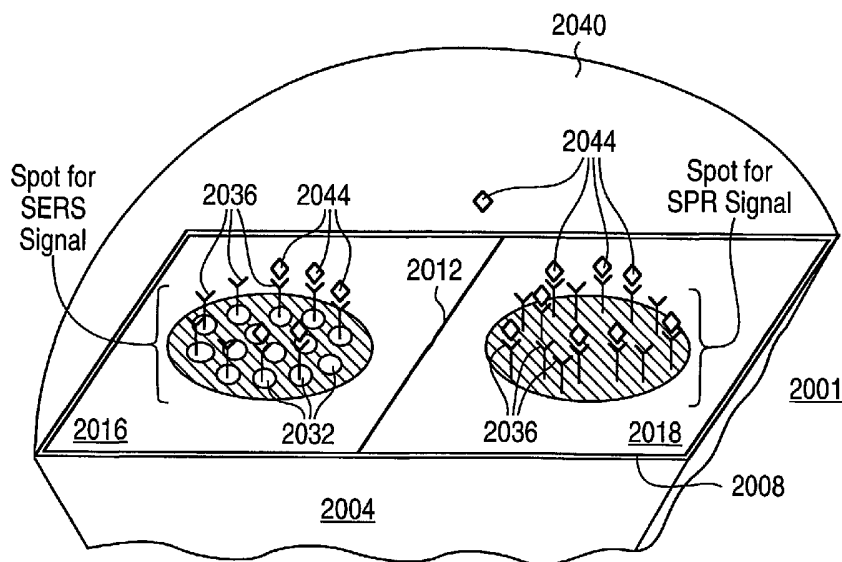
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- (71) Applicant: ARRAY BIOSCIENCE CORPORATION
[US/US]; 4703 Tidewater Avenue, Suite F, Oakland, CA
94601 (US).
- (72) Inventors: KREIMER, David, I.; 1841 Dwight Way,
Berkeley, CA 94703 (US). YEVIN, Oleg, A.; 1364 Creek-
side Drive, Apartment 204, Walnut Creek, CA 94596 (US).
- (74) Agents: MEYER, Sheldon, R. et al.; Fliesler Dubb Meyer
and Lovejoy LLP, Four Embarcadero Center, Suite 400,
San Francisco, CA 94111-4156 (US).
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[Continued on next page]

(54) Title: DEVICES AND METHODS FOR VERIFYING MEASUREMENT OF ANALYTES BY RAMAN SPECTROSCOPY AND SURFACE PLASMON RESONANCE



(57) Abstract: Devices and methods are provided that permit validation of analyte detection using both surface enhanced Raman spectroscopy (SERS) and surface plasmon resonance (SPR). In specific embodiments, a substrate (2008) having a surface suitable for SPR is provided, along with a source of electromagnetic radiation (2016) to interact with the surface and thereby elicit surface plasmon resonance characteristic of the analyte under study. Surface enhancing structures (2032) are also provided on the substrate (2008), and analytes under study are associated with enhancing structures (2032). Another source of electromagnetic radiation (2016) is directed at the analyte on the enhancing structures to produce surface enhanced Raman scattering. In certain embodiments, data obtained by these two methods are compared, thereby providing an internally consistent and self-validating method for analyte detection.



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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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.

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8 May 2003

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/29766

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G01N 33/543
 US CL : 435/7.1

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. : Please See Continuation Sheet

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)
 Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,149,868 A (NATAN et al) 21 November 2000 (21.11.2000), see entire document.	1-17
A	US 6,025,202 A (NATAN) 15 February 2000 (15.02.2000), see entire document.	1-17
A	US 5,266,498 A (TARCHA et al) 30 November 1993 (30.11.1993), see entire document.	1-17
A	US 5,017,007 A (MILNE et al) 21 May 1991 (21.05.1991), see entire document.	1-17

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	"&" 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

Date of mailing of the international search report

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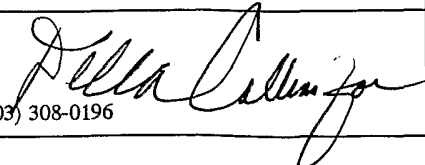
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Name and mailing address of the ISA/US
 Commissioner of Patents and Trademarks
 Box PCT
 Washington, D.C. 20231
 Facsimile No. (703)305-3230

Authorized officer

Chris L. Chin

Telephone No. (703) 308-0196



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/29766

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim 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. Claim 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.:

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

PCT/US02/29766

Continuation of B. FIELDS SEARCHED Item 1:

356/301

422/57, 82.05, 82.11;

435/7.1, 287.2, 288.7, 808;

436/164, 518, 524, 525, 805

Continuation of B. FIELDS SEARCHED Item 3:

EAST, CAS

Search terms: SPR, SERS, surface plasmon resonance, surface enhanced Raman spectroscopy