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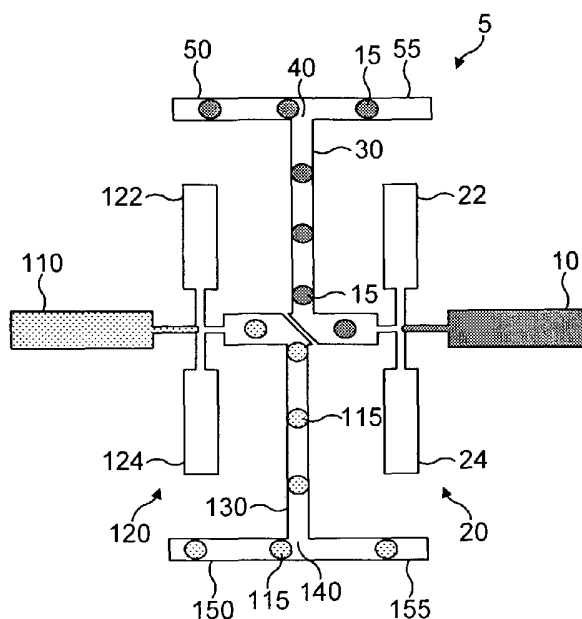
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[Continued on next page]

(54) Title: COMPARTMENTALISED SCREENING BY MICROFLUIDIC CONTROL



(57) Abstract: The invention describes a method for the identification of compounds which bind to a target component of a biochemical system or modulate the activity of the target, comprising the steps of: a) compartmentalising the compounds into microcapsules together with the target, such that only a subset of the repertoire is represented in multiple copies in any one microcapsule; and b) identifying the compound which binds to or modulates the activity of the target; wherein at least one step is performed under microfluidic control. The invention enables the screening of large repertoires of molecules which can serve as leads for drug development.

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# INTERNATIONAL SEARCH REPORT

international application No
PCT      05/003924

**A. CLASSIFICATION OF SUBJECT MATTER**  
 G01N33/543      B01J19/00

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)  
 G01N    B01J

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, COMPENDEX, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	-/--	

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

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\*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.

\*Z\* document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No  
 PC 2005/003924

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/23163 A (CALIFORNIA INSTITUTE OF TECHNOLOGY; QUAKE, STEPHEN, R; THORSEN, TODD) 21 March 2002 (2002-03-21)	1,2,4-8, 13,14, 18-21, 24,25, 27-32, 34-36, 38,39, 67-74, 76-83, 101-103, 106, 113-115
Y	page 5, line 1 - page 7, line 21 page 8, line 19 - page 9, line 9 page 22, line 7 - page 23, line 10 page 28, lines 24-29 page 32, lines 1-25 page 35, lines 9-17 page 46, lines 4-23 page 48, line 11 - page 51, line 21 page 58, line 1 - page 60, line 22 page 85, line 9 - page 88, line 7 claims 28-46; figure 22 ----- -/--	1-115

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/JP05/003924

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/31203 A (DIVERSA CORPORATION; SHORT, JAY, M; KELLER, MARTIN; LAFFERTY, WILLIAM,) 18 April 2002 (2002-04-18)	1, 2, 4-8, 13, 14, 18-21, 27-33, 38, 39, 67-70, 81, 101-103, 113-115
Y	claims 1, 3, 15, 25-27, 34, 41, 43, 47-49, 62, 69, 76, 80, 84 claims 95, 114, 121, 127-129, 136, 142-144, 146 claims 153, 154, 160-162, 165 page 21, last paragraph - page 22, paragraph 2 page 23, paragraph 2 page 24, paragraph 3 page 25, paragraph 2 page 30, last paragraph - page 34, paragraph 1 page 36, paragraphs 1, 2 page 37, paragraph 2 page 38, paragraph 2 page 43, last paragraph page 54, last paragraph - page 55, last paragraph page 59, paragraph 2 page 69, paragraph 2 - page 70, paragraph 2 page 73, last paragraph - page 76, paragraph 1 page 78, paragraph 3 - page 79, last paragraph page 81, last paragraph - page 85, paragraph 3 examples 8, 13 page 133, paragraph 1 - page 134, paragraph 2	1-115
Y	----- WO 2004/024917 A (MEDICAL RESEARCH COUNCIL; GRIFFITHS, ANDREW; TAWFIK, DAN) 25 March 2004 (2004-03-25) page 4, lines 11-20 page 6, line 26 - page 8, line 18 page 9, line 23 - page 11, line 18 page 16, line 21 - page 17, line 28 page 23, line 5 - page 24, line 5 page 26, lines 21-31 page 28, lines 14-30 page 29, line 28 - page 31, line 2 page 34, line 13 - page 35, line 25 claims 1-17; figure 1 ----- -/--	1-115

## INTERNATIONAL SEARCH REPORT

Inter	application No
PC	005/003924

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 2004/087308 A (MEDICAL RESEARCH COUNCIL; GRIFFITHS, ANDREW, DAVID; ABELL, CHRIS; HOLL) 14 October 2004 (2004-10-14) claims 1-110	13, 106-110, 112
P,X	WO 2004/088314 A (MEDICAL RESEARCH COUNCIL; GRIFFITHS, ANDREW, DAVID; ABELL, CHRIS; HOLL) 14 October 2004 (2004-10-14) claims 1,75-83 page 7, line 18 - page 8, line 2 page 18, line 17 - page 21, line 12 example 5	1-115
X	GRIFFITHS A D ET AL: "Directed evolution of an extremely fast phosphotriesterase by in vitro compartmentalization" EMBO JOURNAL, OXFORD UNIVERSITY PRESS, SURREY, GB, vol. 22, no. 1, 2 January 2003 (2003-01-02), pages 24-35, XP002272486 ISSN: 0261-4189	102
Y	the whole document	1-101, 103-115
Y	SONG ET AL: "A Microfluidic System for Controlling Reaction Networks in Time" ANGEWANDTE CHEMIE, WILEY-VCH, WEINHEIM, DE, vol. 42, no. 7, 17 February 2003 (2003-02-17), pages 768-772, XP002289726 ISSN: 1433-7851 the whole document	1-115

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB2005/003924

## Box 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 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 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

International Application No. PCT/GB2005 /003924

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-101,103-115

Methods for identifying or preparing a compound, wherein at least one step is carried out under microfluidic control.

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2. claim: 102

Methods for preparing a compound, comprising the steps of compartmentalising, optionally sorting and identifying the compounds.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte	Application No
PC	J05/003924

Patent document cited in search report	A	Publication date	AU	Patent family member(s)	A	Publication date
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