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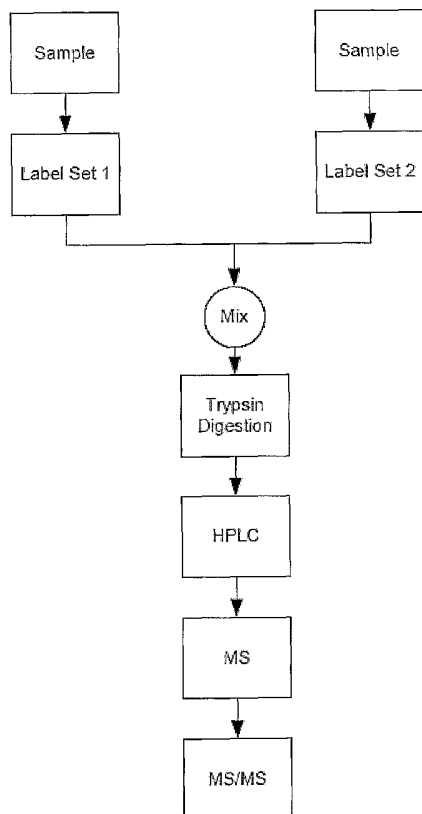
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[Continued on next page]

(54) Title: ULTRA-SENSITIVE DETECTION SYSTEMS USING MULTIDIMENSION SIGNALS



(57) Abstract: Disclosed are compositions and methods for sensitive detection of one or multiple analytes. In general, the methods involve the use of special label components, referred to as multidimension signals. In the disclosed methods, analysis of multidimension signals can result in one or more predetermined patterns that serve to indicate whether a further level of analysis can or should be performed and/or which portion(s) of the analyzed material can or should be analyzed in a further level of analysis. In some forms, isobaric and non-isobaric elements can be used together in the same assay or assay system. Isobaric and non-isobaric multidimension signals used together can generate one or more predetermined patterns during analysis. The pattern generated in this first level of analysis indicates whether the second level of analysis should be performed. The second level of analysis can involve distinguishing the isobaric multidimension signals.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

INV. G01N33/68 C07K1/13 C12Q1/04

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)

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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, 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	WO 02/14867 A (AGILIX CORPORATION) 21 February 2002 (2002-02-21) *the whole document, especially page 4, line 17 - page 7, line 15, claims, abstract*	1-18, 22-25, 28-31
X	US 2003/124595 A1 (LIZARDI PAUL M) 3 July 2003 (2003-07-03) *abstract, paragraphs 0055-0066, 0072, 0078, claims 82-90*	1-16,26, 27,32,33
X	WO 2004/070352 A (APPLERA CORPORATION) 19 August 2004 (2004-08-19) the whole document ----- -/--	19-21



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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.
Y	HALL, M.P., ET AL: "'Mass defect' tags for biomolecular mass spectrometry" JOURNAL OF MASS SPECTROMETRY, vol. 38, 2003, pages 809-816, XP002395299 the whole document	1-33
Y	US 2002/172961 A1 (SCHNEIDER LUKE V ET AL) 21 November 2002 (2002-11-21) the whole document	1-33
Y	AGILIX CORPORATION: "Introducing i-PROT Labeling"[Online] 2004, XP002395300 Retrieved from the Internet: URL:http://web.archive.org/web20041013130447/http://agilixcorp.com/iprot.php> the whole document	1-33
Y	APPLIED BIOSYSTEMS: "iTRAQ Reagents Amine-specific Labeling REagents for Multiplexed Relative and Absolute Protein Quantitation"[Online] 2004, XP002395301 Retrieved from the Internet: URL:http://docs.appliedbiosystems.com/pebi/docs/00113379.pdf> the whole document	1-33
Y	SMOLKA M B ET AL: "Optimization of the isotope-coded affinity tag-labeling procedure for quantitative proteome analysis" ANALYTICAL BIOCHEMISTRY, ACADEMIC PRESS, NEW YORK, NY, US, vol. 297, 2001, pages 25-31, XP002313134 ISSN: 0003-2697 the whole document	1-33
Y	ROYAL SOCIETY OF CHEMISTRY'S CHEMICAL SCIENCE NETWORK: "Isotope Coded Affinity Tags"[Online] 2002, XP002395302 Retrieved from the Internet: URL:http://www.chemsoc.org/ExemplarChem/entries/2002/proteomics/icat.htm#top> the whole document	1-33

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0214867	A	21-02-2002	AU 8356201 A	25-02-2002
			CA 2419159 A1	21-02-2002
			EP 1350106 A2	08-10-2003
			JP 2004506900 T	04-03-2004
US 2003124595	A1	03-07-2003	NONE	
WO 2004070352	A	19-08-2004	AU 2004209401 A1	19-08-2004
			CA 2488584 A1	19-08-2004
			EP 1588145 A2	26-10-2005
US 2002172961	A1	21-11-2002	US 2006073485 A1	06-04-2006