



(51) International Patent Classification:

G01N 24/12 (2006.01) G01R 33/62 (2006.01)  
G01N 24/10 (2006.01) G01R 33/60 (2006.01)  
G01R 33/24 (2006.01)

(21) International Application Number:

PCT/US2012/035663

(22) International Filing Date:

27 April 2012 (27.04.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/481,148 29 April 2011 (29.04.2011) US  
61/566,581 2 December 2011 (02.12.2011) US

(71) Applicant (for all designated States except US): **CHILDREN'S HOSPITAL & RESEARCH CENTER AT OAKLAND** [US/US]; 5700 Martin Luther King, Jr. Way, Oakland, CA 94606 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **ODA, Michael, N.** [US/US]; 1988 Gentle Creek Drive, Fairfield, CA 94534 (US).

(74) Agents: **DONAHUE, Brian A.** et al.; Morrison & Foerster LLP, 755 Page Mill Road, Palo Alto, CA 94304-1018 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available):

AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available):

ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

27 December 2012

(54) Title: COMPOSITIONS AND METHODS TO ASSESS THE CAPACITY OF HDL TO SUPPORT REVERSE CHOLESTEROL TRANSPORT

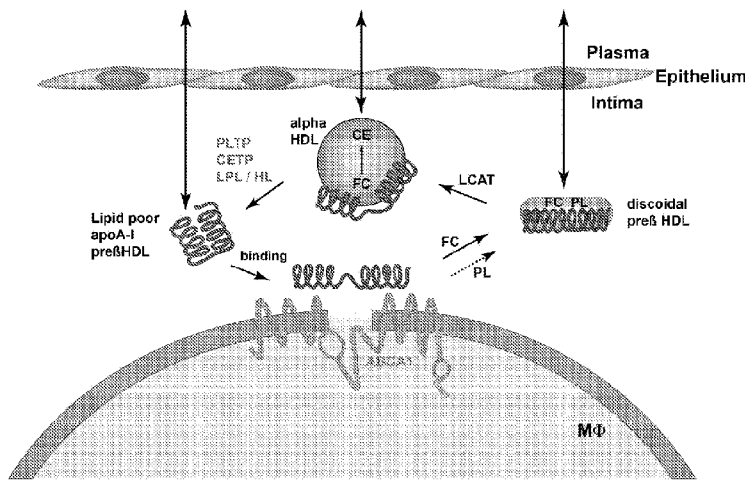


Figure 2

(57) Abstract: The invention provides compositions and methods for assessing the capacity of high density lipoprotein (HDL) to support reverse cholesterol transport in blood by measuring exchange if HDL- specific spin-labeled lipoprotein probes and electron paramagnetic spectroscopy. The invention also provides methods to identify individuals at risk for cardiovascular disease, to monitor the treatment of cardiovascular disease and in the development of therapies to treat cardiovascular disease. The invention also provides methods to identify individuals at risk for Alzheimer's disease, to monitor the treatment of Alzheimer's disease and in the development of therapies to treat Alzheimer's disease.



## A. CLASSIFICATION OF SUBJECT MATTER

**G01N 24/12 (2006.01) G01N 24/10 (2006.01) G01R 33/24 (2006.01) G01R 33/62 (2006.01) G01R 33/60 (2006.01)**

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)

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)

WPI, EPODOC, MEDLINE, HCAPLUS, BIOSIS & EMBASE for cholesterol, cardiovascular, Alzheimer's, EPR, spin label, high density lipoprotein and like terms.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Documents are listed in the continuation of Box C		



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 but 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  
13 November 2012

Date of mailing of the international search report  
13 November 2012

## Name and mailing address of the ISA/AU

AUSTRALIAN PATENT OFFICE  
PO BOX 200, WODEN ACT 2606, AUSTRALIA  
Email address: pct@ipaaustralia.gov.au  
Facsimile No.: +61 2 6283 7999

## Authorised officer

Vishal Desai  
AUSTRALIAN PATENT OFFICE  
(ISO 9001 Quality Certified Service)  
Telephone No. +61262833180

INTERNATIONAL SEARCH REPORT		International application No.
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		<b>PCT/US2012/035663</b>
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	LAGERSTEDT, J.O. et al. 'Mapping the structural transition in an amyloidogenic apolipoprotein A-I' <i>Biochemistry</i> , August 2007, Vol.46, No.34, pages 9693-9699. Abstract; 'Materials & Methods'; Figure 4	85-116, 118-137 & 139-144
X	LAGERSTEDT, J.O. et al. 'Electron paramagnetic resonance spectroscopy of site-directed spin labels reveals the structural heterogeneity in the N-terminal domain of apoA-I in solution' <i>The Journal of Biological Chemistry</i> , March 2007, Vol.282, No.12, pages 9143-9149. Abstract; 'Experimental Procedures'; Figures 1 & 3	85-116, 118-137 & 139-144
X	LAGERSTEDT, J.O. et al. 'Structure of apolipoprotein A-I N terminus on nascent high density lipoproteins' <i>The Journal of Biological Chemistry</i> , January 2011, Vol.286, No.4, pages 2966-2975. Abstract; 'Experimental Procedures'; Figures 1 & 3-4	85-116, 118-137 & 139-144
A	LAUDERBACK, C.M. et al. 'Vulnerability of synaptosomes from apoE knock-out mice to structural and oxidative modifications induced by A beta(1-40): implications for Alzheimer's disease' <i>Biochemistry</i> , February 2001, Vol.40, No.8, pages 2548-2554. See whole citation	1-383
A	SHAKOV, Y. et al. 'Reduced ability of high density lipoprotein to accept cellular cholesterol in hypoalphacholesterolemia' <i>Biologicheskie Membrany</i> , 1990, Vol.7, No.6, pages 626-633. See whole citation	1-383
A	GORSHKOVA, I.N. et al. 'A study of thermoinduced changes in human high-density lipoproteins in hypo-alpha-lipoproteinemia and ischemic heart disease by the spin label method' <i>Voprosy meditsinskoi khimii</i> , May-June 1988, Vol.34, No.3, pages 85-90. See whole citation	1-383