

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 September 2006 (28.09.2006)

PCT

(10) International Publication Number
WO 2006/102674 A3

(51) International Patent Classification:

C07D 205/06 (2006.01) **C07D 263/24** (2006.01)
C07D 233/32 (2006.01) **A61K 31/397** (2006.01)
C07D 205/04 (2006.01) **A61P 3/00** (2006.01)

(21) International Application Number:

PCT/US2006/011197

(22) International Filing Date: 24 March 2006 (24.03.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/664,863 24 March 2005 (24.03.2005) US

(71) Applicant (for all designated States except US): **MICRO-BIA, INC.** [US/US]; 320 Bent Street, Cambridge, Massachusetts 02141 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **TALLEY, John** [US/US]; 96 North Street, Somerville, Massachusetts 02144 (US). **MARTINEZ, Eduardo** [US/US]; 271 North Street, Apt. 1, Boston, Massachusetts 02113 (US). **ZIMMER, Daniel** [US/US]; 391 Broadway, Apt. 501, Somerville, Massachusetts 02145 (US). **LUNDRI-GAN-SOUCY, Regina** [US/US]; 87 Scribner Road, Tyngsboro, Massachusetts 01879 (US).

(74) Agent: **BODEN, Martha**; Heslin Rothenberg Farley & Mesiti, P.C., 5 Columbia Circle, Albany, New York 12203 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (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:

14 December 2006

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: DIPHENYLHETEROCYCLE CHOLESTEROL ABSORPTION INHIBITORS

(57) Abstract: Various azetidinone, pyrrolidine, imidazolidine, and oxazolidine derivative are described, as are pharmaceutical compositions containing these compound and their use for preparing medicaments for the treatment of hypercholesterolemia



WO 2006/102674 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/011197

A. CLASSIFICATION OF SUBJECT MATTER

INV. C07D205/06 C07D233/32 C07D205/04 C07D263/24 A61K31/397
A61P3/00

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)

C07D A61K A61P

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, CHEM ABS Data, 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	KVAERNO L ET AL: "An In Vitro Assay for Evaluation of Small-Molecule Inhibitors of Cholesterol Absorption" ANGEWANDTE CHEMIE. INTERNATIONAL EDITION, WILEY VCH VERLAG, WEINHEIM, DE, vol. 43, 2004, pages 4653-4655, XP002362656 ISSN: 1433-7851 example 16	7,8
X	KVAERNO ET AL: ORGANIC LETTERS, vol. 7, no. 6, 17 March 2005 (2005-03-17), pages 1145-1148, XP002391847 example 15 ----- -/-	24

☒ 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
- *E* earlier document but published on or after the international filing date
- *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)
- *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.
- *&* document member of the same patent family

Date of the actual completion of the international search

25 July 2006

Date of mailing of the international search report

15/09/2006

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Lauro, P

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/011197

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DUGAR S ET AL: "Gamma-Lactams And Related Compounds as Cholesterol Absorption Inhibitors: Homologs of Beta Lactam Absorption INhibitor SCH 48461" BIOORGANIC & MEDICINAL CHEMISTRY LETTERS, OXFORD, GB, vol. 5, no. 24, 1995, pages 2947-2952, XP002362657 ISSN: 0960-894X the whole document	1-35
Y	CLADER J W ET AL: "2-AZETIDINONE CHOLESTEROL ABSORPTION INHIBITORS: STRUCTURE-ACTIVITY RELATIONSHIPS ON THE HETEROCYCLIC NUCLEUS" JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY, WASHINGTON, US, vol. 39, no. 19, 1996, pages 3684-3693, XP001179749 ISSN: 0022-2623 the whole document	1-35
Y	ROSENBLUM S B ET AL: "Discovery of 1-(4-Fluorophenyl)-(3R)-[3-(4-fluorophenyl)-(3S)-hydroxypropyl]-(4S)-(4-hydroxyphenyl)-2-azetidinone (SCH 58235): A Designed, Potent, Orally Active Inhibitor of Cholesterol Absorption" JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY, WASHINGTON, US, vol. 41, 1998, pages 973-980, XP002275926 ISSN: 0022-2623 the whole document	1-35
P,Y	WO 2005/047248 A (MICROBIA, INC; MARTINEZ, EDUARDO; TALLEY, JOHN, J; ANTONELLI, STEPHEN;) 26 May 2005 (2005-05-26) the whole document	1-35

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/011197

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005047248 A	26-05-2005	AU 2004288822 A1 CA 2545058 A1	26-05-2005 26-05-2005