(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
30 May 2003 (30.05.2003)

PCT

(10) International Publication Number
WO 03/043985 A1

(51) International Patent Classification[7]: C07D 209/12, 413/12, 205/04, 405/12, 207/48, 403/12, 401/12, 417/12, A61K 31/40, 31/395, A61P 3/04, 3/06, 3/10, 25/28, 11/00, 1/04

(21) International Application Number: PCT/EP02/13025

(22) International Filing Date:
20 November 2002 (20.11.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/331,986 21 November 2001 (21.11.2001) US
60/396,906 18 July 2002 (18.07.2002) US

(71) Applicant *(for all designated States except AT, US)*: **NOVARTIS AG** [CH/CH]; Lichtstrasse 35, CH-4056 Basel (CH).

(71) Applicant *(for AT only)*: **NOVARTIS PHARMA GMBH** [AT/AT]; Brunner Strasse 59, A-1230 Viena (AT).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **BACH, Andrew, Thomas** [US/US]; 103 Park Avenue, Unit A-5, Summit NJ 07901 (US). **KAPA, Prasad, Koteswara** [IN/US]; 4 Faber Road, Parsippany, NJ 07054 (US). **LEE, George, Tien-San** [—/US]; 15 Bonnieview Lane, Towaco, NJ 07082 (US). **LOESER, Eric, M.** [US/US]; 92-A Van Wyk Road, Lake Hiawatha, NJ 07034 (US). **SABIO, Michael, Lloyd** [US/US]; 46 Center Grove Road, Apt U-414, Randolph, NJ 07869 (US). **STANTON, James, Lawrence** [US/US]; 4 Fawnridge Road, Lebanon, NJ 08833 (US). **VEDANANDA, Thalaththani, Ralalage** [US/US]; 31 Edinburgh Drive, Randolph, NJ 07869 (US).

(74) Agent: **GROS, Florent**; Novartis AG, Corporate Intellectual Property, Patent and Trademark Department, CH-4002 Basel (CH).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LT, LU, LV, MA, MD, MK, MN, MX, NO, NZ, OM, PH, PL, PT, RO, RU, SE, SG, SI, SK, TJ, TM, TN, TR, TT, UA, US, UZ, VC, VN, YU, ZA, ZW.

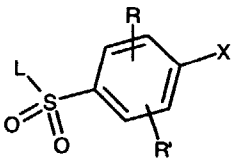
(84) Designated States *(regional)*: Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR).

Published:
— *with international search report*

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.

WO 03/043985 A1

(54) Title: HETEROCYCLIC COMPOUNDS AND METHODS OF USE



(I)

(57) Abstract: Compounds of the formula (I) provide pharmacological agents which are potent agonists of Peroxisome Proliferator-Activated Receptors (PPARs). Accordingly, the compounds of the instant invention are useful for the treatment of conditions mediated by the PPAR receptor activity in mammals. Such conditions include dyslipidemia, hyperlipidemia, hypercholesteremia, atherosclerosis, hypertriglyceridemia, heart failure, myocardial infarction, vascular diseases, cardiovascular diseases, hypertension, obesity, inflammation, arthritis, cancer, Alzheimer's disease, skin disorders, respiratory diseases, ophthalmic disorders, inflammatory bowel diseases, ulcerative colitis and Crohn's disease. The compounds of the present invention are particularly useful in mammals as hypoglycemic agents for the treatment and prevention of conditions in which impaired glucose tolerance, hyperglycemia and insulin resistance are implicated, such as type-1 and type-2 diabetes, and Syndrome X. Preferred are the compounds of the invention which are dual agonists of PPARa and PPARy receptors.