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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
7 March 2002 (07.03.2002)

PCT

(10) International Publication Number
WO 02/18346 A1

(51) International Patent Classification[7]: C07D 231/40, 231/38, 405/04, 401/12, 403/12, 417/06, 413/08, A61K 31/415, A61P 25/00

(21) International Application Number: PCT/IB01/01540

(22) International Filing Date: 24 August 2001 (24.08.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/229,415 31 August 2000 (31.08.2000) US

(71) Applicant *(for all designated States except US)*: **PFIZER PRODUCTS INC.** [US/US]; Eastern Point Road, Groton, CT 06340 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **COOPER, Christopher, Blair** [US/US]; Pfizer Global Research and Development, Eastern Point Road, Groton, CT 06340 (US). **HELAL, Christopher, John** [US/US]; Pfizer Global Research and Development, Eastern Point Road, Groton, CT 06340 (US). **SANNER, Mark, Allen** [US/US]; Pfizer Global Research and Development, Eastern Point Road, Groton, CT 06340 (US). **WAGER, Travis, T.** [US/US]; Pfizer Global Research and Development, Eastern Point Road, Groton, CT 06340 (US).

(74) Agents: **LUMB, J., Trevor** et al.; c/o Simpson, Alison, Urquhart-Dykes & Lord, 30 Welbeck Street, London, W1G 8ER (GB).

(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, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

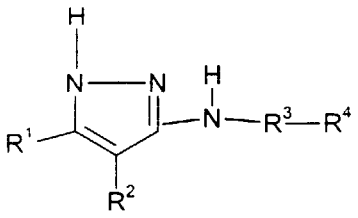
(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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 02/18346 A1

(54) Title: PYRAZOLE DERIVATIVES AND THEIR USE AS PROTEIN KINASE INHIBITORS



(1)

(57) Abstract: The invention provides compounds of formula (1) wherein R^1, R^2, R^3, and R^4 are as defined, and their pharmaceutically acceptable salts. Compounds of formula (1) are indicated to have activity inhibiting cdk2, and GSK-3. Pharmaceutical compositions and methods comprising compounds of formula (1) for treating and preventing diseases and conditions comprising abnormal cell growth, such as cancer, and neurodegenerative diseases and conditions and those affected by dopamine neurotransmission. Also described are pharmaceutical compositions and methods comprising compounds of formula (1) for treating male fertility and sperm motility; diabetes mellitus; impaired glucose tolerance; metabolic syndrome or syndrome X; polycystic ovary syndrome; adipogenesis and obesity; myogenesis and frailty, for example age-related decline in physical performance; acute sarcopenia, for example muscle atrophy and/or cachexia associated with burns, bed rest, limb immobilization, or major thoracic, abdominal, and/or orthopedic surgery; sepsis; hair loss, hair thinning, and balding; and immunodeficiency.