

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

(19) World Intellectual Property Organization
International Bureau



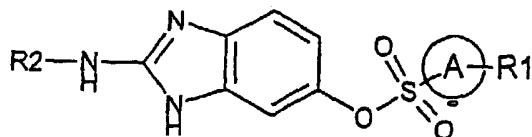
(43) International Publication Date
10 April 2003 (10.04.2003)

PCT

(10) International Publication Number
WO 03/028721 A3

- (51) International Patent Classification⁷: **A61K 31/4184**, C07D 235/30, 235/32, 401/12, 401/14, 403/12, 405/12, 409/12, A61P 35/00
- (74) Agent: **LE PENNEC, Magali**; AVENTIS PHARMA S.A., Patent Department, 20 avenue Raymond Aron, F-92165 ANTONY CEDEX (FR).
- (21) International Application Number: PCT/EP02/11353
- (22) International Filing Date:
26 September 2002 (26.09.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
01402460.8 26 September 2001 (26.09.2001) EP
- (71) Applicant (for all designated States except US): **AVENTIS PHARMA S.A.** [FR/FR]; 20 avenue Raymond Aron, F-92160 ANTONY (FR).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **CLERC, François** [FR/FR]; 35 boulevard Colbert, F-92160 ANTONY (FR). **HAMY, François** [FR/FR]; 42 rue Hoffet, F-68110 ILLZACH (FR). **DEPATY, Isabelle** [FR/FR]; 7 rue G.B. Shaw, F-75015 PARIS (FR). **ANGOILLANT-BONIFACE, Odile** [FR/FR]; 26 rue du Commandant Mouchotte, F-75014 PARIS (FR). **DEPRETS, Stéphanie** [FR/FR]; 203 rue de Vaugirard, F-75015 PARIS (FR). **CARREZ, Chantal** [FR/FR]; 3 rue Ernest Hemingway, F-94320 THIAIS (FR). **ROESNER, Manfred** [DE/DE]; Altkönigblick 8, 65817 EPPSTEIN/BREMTHAL (DE).
- (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, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), 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), OAPI patent (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:
11 December 2003
- 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: SUBSTITUTED BENZIMIDAZOLE COMPOUNDS AND THEIR USE FOR THE TREATMENT OF CANCER



(I)

(57) Abstract: New benzimidazole compounds of formula I and their use as cyclin-dependent kinases inhibitors compounds as well as new pharmaceutical compositions containing them. (Formula I).

WO 03/028721 A3

INTERNATIONAL SEARCH REPORT

national Application No
PCT/EP 02/11353

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K31/4184 C07D235/30 C07D235/32 C07D401/12 C07D401/14
C07D403/12 C07D405/12 C07D409/12 A61P35/00

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)

IPC 7 C07D

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)

BEILSTEIN Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 41669 A (ANGIOGENE PHARM LTD ;DAVIS PETER DAVID (GB)) 20 July 2000 (2000-07-20) cited in the application claim 1 ---	1-8
X	EP 0 115 039 A (HOECHST AG) 8 August 1984 (1984-08-08) see examples on pages 8-14 ---	1-8
X	DE 25 41 752 A (HOECHST AG) 24 March 1977 (1977-03-24) see examples on pages 7-8 -----	1-8



Further documents are listed in the continuation of box C.



Patent family members are listed in 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

26 February 2003

Date of mailing of the international search report

11/03/2003

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

Bérillon, L

INTERNATIONAL SEARCH REPORT

Information on patent family members

National Application No

PCT/EP 02/11353

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0041669	A	20-07-2000	AU 1995700 A CA 2360415 A1 EP 1140078 A2 WO 0041669 A2 JP 2002534452 T	01-08-2000 20-07-2000 10-10-2001 20-07-2000 15-10-2002
EP 0115039	A	08-08-1984	DE 3247615 A1 AR 241017 A1 AT 32459 T AU 558902 B2 AU 2280883 A CA 1199642 A1 DE 3375659 D1 DK 593883 A ,B, EP 0115039 A1 ES 8406448 A1 FI 834709 A GR 79454 A1 HU 192972 B IL 70520 A JP 1743748 C JP 4034545 B JP 59118774 A KR 9100045 B1 NO 834773 A NZ 206658 A PH 21374 A PT 77876 A ,B US 4639463 A ZA 8309534 A ZM 9283 A1	05-07-1984 30-04-1991 15-02-1988 12-02-1987 28-06-1984 21-01-1986 17-03-1988 24-06-1984 08-08-1984 01-11-1984 24-06-1984 30-10-1984 28-08-1987 31-01-1988 15-03-1993 08-06-1992 09-07-1984 19-01-1991 25-06-1984 11-06-1986 15-10-1987 01-01-1984 27-01-1987 29-08-1984 21-06-1984
DE 2541752	A	24-03-1977	DE 2541752 A1 AT 358575 B AT 690876 A CA 1069909 A1 CH 619938 A5 DK 419876 A ,B, ES 451497 A2 FI 762653 A GR 60799 A1 HU 172484 B LU 75817 A1 NL 7610192 A NO 763196 A PT 65607 A ,B SE 7610310 A	24-03-1977 25-09-1980 15-02-1980 15-01-1980 31-10-1980 20-03-1977 01-12-1977 20-03-1977 30-08-1978 28-09-1978 13-05-1977 22-03-1977 22-03-1977 01-10-1976 20-03-1977