

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 July 2008 (24.07.2008)

PCT

(10) International Publication Number
WO 2008/089105 A3

(51) International Patent Classification:

C07H 19/23 (2006.01) *A61P 31/12* (2006.01)
A61K 31/706 (2006.01) *A61P 35/00* (2006.01)

(21) International Application Number:

PCT/US2008/050929

(22) International Filing Date: 11 January 2008 (11.01.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/880,278 12 January 2007 (12.01.2007) US

(71) Applicant (for all designated States except US):
BIOCRYST PHARMACEUTICALS, INC. [US/US];
2190 Parkway Lake Drive, Birmingham, Alabama 35244
(US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BABU, Yarlaga**
dd S. [IN/US]; 3441 Strollway Drive, Birmingham, Alabama
35226 (US). **CHAND, Pooran** [US/US]; 509 Creekwood
Place, Birmingham, Alabama 35226 (US). **KUMAR, V.**
Satish [IN/US]; 809 Mayapple Court, Birmingham, Al-
abama 35233 (US). **KOTIAN, Pravin L.** [US/US]; 1313
Atkins Trimm Blvd., Hoover, Alabama 35226 (US). **WU,**
Minwan [CN/US]; 2709 Paden Trail, Vestavia Hills, AL
35226 (US).

(74) Agents: **HARRIS, Robert J.** et al.; P.O. Box 111098,
Saint Paul, Minnesota 55111-1098 (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, 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, PG, PH,
PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV,
SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN,
ZA, ZM, ZW.

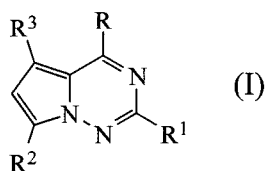
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL,
NO, 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
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
12 September 2008

(54) Title: ANTIVIRAL NUCLEOSIDE ANALOGS



(57) Abstract: The invention provides compounds of Formula (I), as described herein, as well as pharmaceutical compositions comprising the compounds, and synthetic methods and intermediates that are useful for preparing the compounds. The compounds of Formula (I) are useful as anti-viral agents and/or as anti-cancer agents.

WO 2008/089105 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/050929

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07H19/23 A61K31/706 A61P31/12 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)

C07H 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, WPI Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	S.A. PATIL ET AL.: "4-Aza-7,9-dideazaadenosine, a new cytotoxic synthetic C-nucleoside analogue of adenosine" TETRAHEDRON LETTERS, vol. 35, 1994, pages 5339-5342, XP002484790 compound 9 the whole document ----- -/-	1-6,17, 24,27, 36,59

☒ 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

23 June 2008

Date of mailing of the international search report

07/07/2008

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

de Nooy, Arjan

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/050929

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	OTTER B A ET AL: "CONFORMATIONAL PROPERTIES OF PURINE-LIKE C-NUCLEOSIDES" NUCLEOSIDES & NUCLEOTIDES, MARCEL DEKKER, INC, US, vol. 15, no. 1/03, 1 January 1996 (1996-01-01), pages 793-807, XP000575801 ISSN: 0732-8311 compound 9	1
A	NISHIMURA N ET AL: "Synthesis of pyrrolo[2,1-f][1,2,4]triazine C-nucleosides. Isosteres of sangivamycin, tubercidin, and toyocamycin" CARBOHYDRATE RESEARCH, ELSEVIER SCIENTIFIC PUBLISHING COMPANY. AMSTERDAM, NL, vol. 331, no. 1, 9 March 2001 (2001-03-09), pages 77-82, XP004317149 ISSN: 0008-6215 compounds 3-9 the whole document	1,45

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/050929

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 45-56 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.