

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
13 December 2007 (13.12.2007)

PCT

(10) International Publication Number  
**WO 2007/143557 A3**

(51) International Patent Classification:  
A01N 57/00 (2006.01) A61K 31/675 (2006.01)

(21) International Application Number:  
PCT/US2007/070233

(22) International Filing Date: 1 June 2007 (01.06.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/810,276 2 June 2006 (02.06.2006) US

(71) Applicant (for all designated States except US): **BRANDEIS UNIVERSITY MS134** [US/US]; 415 South Street, Waltham, MA 02453-2728 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HEDSTROM, Elizabeth, K.** [US/US]; 27 Lewis Street, Newton, MA 02458 (US). **STRIEPEN, Boris** [DE/US]; 220 Dearing Street, Athens, GA 30605-1009 (US).

(74) Agents: **GORDON, Dana, M.** et al.; Patent Group, Foley Hoag LLP, Seaport World Trade Center West, 155 Seaport Blvd., Boston, MA 02210-2600 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, 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, HU, IE, IS, IT, LT, LU, LV, MC, MT, 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  
— 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:  
8 May 2008

(54) Title: COMPOUNDS AND METHODS FOR TREATING MAMMALIAN GASTROINTESTINAL PARASITIC INFECTIONS

(57) Abstract: One aspect of the present invention relates to compounds, and pharmaceutically acceptable salts and prodrugs thereof, that are useful as inhibitors of IMPDH. The invention also provides pharmaceutical compositions comprising the compounds of the invention which selectively inhibit parasitic IMPDH. In certain embodiments, the present invention relates to selective inhibition of *C. parvum* inosine-5'-monophosphate-dehydrogenase over human inosine-5'-monophosphate-dehydrogenase (IMPDH type I and type II). These compounds may be used alone or in combination with other therapeutic or prophylactic agents, such as anti-virals, anti-inflammatory agents, antimicrobials and immunosuppressants.



WO 2007/143557 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/70233

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC(8) - A01N 57/00; A61K 31/675 (2008.01)  
 USPC - 514/82

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)  
 USPC- 514/82

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
 USPC- 514/47; 514/50; 514/71; 514/81 ;514/253.06 ;514/253.08; 514/314 (see search terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 WEST: DB=PGPB,USPT,USOC,EPAB,JPAB  
 Google: patents/Scholar impdh inhibitors/ protozoal inhibitors

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,867,299 B2 (BROADHURST et al.) 15 March 2005 (15.03.2005) col 2, ln 15-47; col 297, ln 11-14, ln 21-25; col 559-col 562, Table 1b	1-61, 77-139, 171-231
Y	WHITBY et al. Crystal Structure of Tritrichomonas Foetus Inosene-5'-monophosphate Dehydrogenase and the Enzyme-Product Complex. Biochemistry, 1997, 36:10666-10674, especially pp 10666, abstract; Fig. 3 and 6; pg.10673, Fig. 7	1-61, 77-139, 171-231

Further documents are listed in the continuation of Box C.


* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search  
 27 January 2008 (27.01.2008)

Date of mailing of the international search report  
**10 MAR 2008**

Name and mailing address of the ISA/US  
 Mail Stop PCT, Attn: ISA/US, Commissioner for Patents  
 P.O. Box 1450, Alexandria, Virginia 22313-1450  
 Facsimile No. 571-273-3201

Authorized officer:  
 Lee W. Young  
 PCT Helpdesk: 571-272-4300  
 PCT OSP: 571-272-7774



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/70233

**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:
  
- 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.: 156-170  
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:  
see extra sheet

- 1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
- 2.  As all searchable claims could be searched without effort justifying 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 report covers 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.:  
1-61, 77-78, 79-139 and 171-231

**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.