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- (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, CL, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— with international search report (Art. 21(3))
- (88) **Date of publication of the international search report:**
11 July 2013

(54) **Title:** DECOQUINATE PRODRUGS

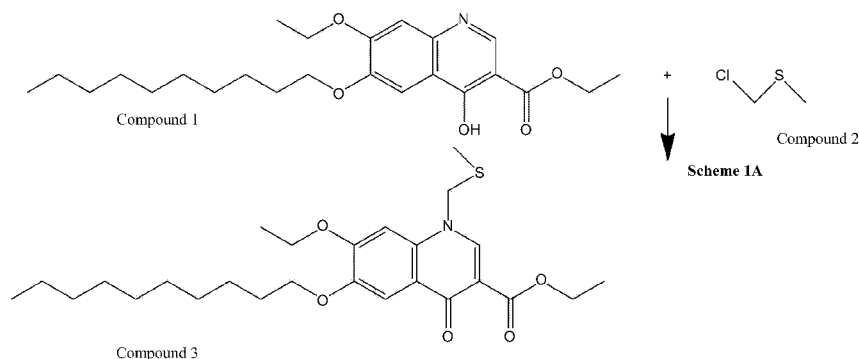


Fig. 1A

(57) **Abstract:** A compound can include a structure having decoquinone coupled to a prodrug moiety, or derivative or isomer or pharmaceutically acceptable salt thereof. The compound can be a decoquinone prodrug. The decoquinone prodrug can have a structure of any of the formulae described herein. The decoquinone prodrug can be synthesized in any manner, such as a synthetic method that includes Scheme 1A or Scheme 1B and Schemes 2, 3, and/or 4. The decoquinone prodrug can be prepared into a pharmaceutical composition with a pharmaceutically acceptable carrier, such as an aqueous composition. The decoquinone prodrug can be used for inhibiting or treating a parasitic infection, such as a malarial infection or a coccidian infection.



A. CLASSIFICATION OF SUBJECT MATTER*C07D 215/56(2006.01)i*

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)

C07D 215/56; A61K 31/573; A61K 31/4353; A61K 9/20; A01N 57/00; A61K 31/12; A61K 31/47; C07J 5/00; A61K 9/48; A61K 38/17

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: decoquinat, prodrug moiety, parasitic infection, malarial infection, coccidian infection

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2009-143297 A1 (NEUROGESX, INC.) 26 November 2009	1,11,12
A	See abstract, claims 1, 4, 8 and paragraphs [0009], [0020], [0038], [0052], [0071], [0106].	2-10,13-19
A	WO 01-87290 A1 (VIRGINIA TECH INTELLECTUAL PROPERTIES, INC.) 22 November 2001	1-19
	See abstract, claims 1, 4 and page 1, lines 11-13, page 4, lines 26-29, page 6, lines 9-14.	
A	US 2004-0063677 A1 (FINN MYHREN et al.) 01 April 2004	1-19
	See abstract and claims 1, 2, 41, 42.	
A	US 2009-0098200 A1 (TEMTSIN KRAYZ GALIA et al.) 16 April 2009	1-19
	See abstract and claims 1, 5.	
A	US 2007-0190130 A1 (WILLIAM MARK et al.) 16 August 2007	1-19
	See abstract and claims 1, 7.	
A	US 05200418 A (REDMAN; DONALD R. et al.) 06 April 1993	1-19
	See abstract and claim 1.	

 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 application or patent 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 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

27 FEBRUARY 2013 (27.02.2013)

Date of mailing of the international search report

27 FEBRUARY 2013 (27.02.2013)

Name and mailing address of the ISA/KR

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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.: **20-22**
because they relate to subject matter not required to be searched by this Authority, namely:

Claims 20-22 pertain to methods for treatment of the human body by therapy, and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.

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. IAs all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. IAs all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. IAs 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. INo 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.
- I No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/042265

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