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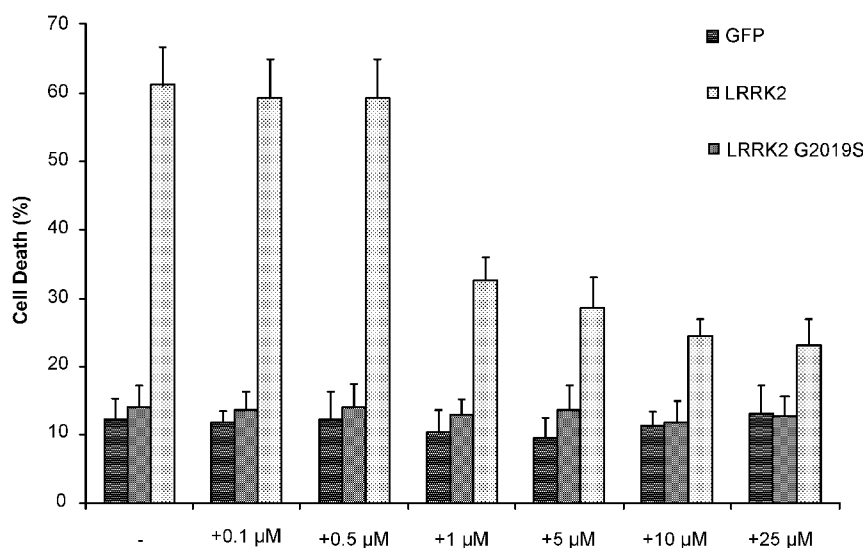
Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

[Continued on next page]

(54) Title: LRRK2 INHIBITORS

Figure 1



(57) Abstract: Provided herein are compounds that inhibit or partially inhibit the activity of leucine rich repeat kinases. Also provided herein are methods of treatment of CNS disorders comprising administration of inhibitors of leucine rich repeat kinases.



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— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**(88) Date of publication of the international search report:**  
10 May 2013

**Published:**

— *with international search report (Art. 21(3))*

**A. CLASSIFICATION OF SUBJECT MATTER**

*C07D 403/06(2006.01)i, C07D 471/04(2006.01)i, C07D 417/06(2006.01)i, C07D 413/14(2006.01)i, A61K 31/404(2006.01)i, A61P 25/00(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 403/06; A61K 31/404; A61P 25/00; A61K 31/475; C07D 209/34; C07D 403/00

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), USPTO, Google & Keywords: LRRK,indolinone

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010-0298376 A1 (D`MELLO SANTOSH R. et al.) 25 November 2010 See Fig 2A-2M, claims 1,16,21,22	1-33
X	WO 2009-030270 A1 (NOVARTIS AG et al.) 12 March 2009 See abstract, claims 1-9	1-33
A	WO 00-35906 A2 (F. HOFFMANN-LA ROCHE AG) 22 June 2000 See the whole document	1-33

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

31 JANUARY 2013 (31.01.2013)

Date of mailing of the international search report

**01 FEBRUARY 2013 (01.02.2013)**

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.: 34-37  
because they relate to subject matter not required to be searched by this Authority, namely:  
The subject-matter of claims 34-37 relates to a method of treatment of the human body, and thus relates to a subject matter which this International Searching Authority is not required, under PCT Article 17(2)(a)(I) and Rule 39.1 (IV), 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.: 37  
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 all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
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.:

**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.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/043757**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010-0298376 A1	25.11.2010	None	
WO 2009-030270 A1	12.03.2009	None	
WO 00-35906 A2	22.06.2000	AT 253062 T	15.11.2003
		AU 1507600 A	03.07.2000
		AU 2000-15076 A1	03.07.2000
		AU 2000-15076 B2	25.03.2004
		AU 771599 B2	25.03.2004
		BR 9916272 A	04.09.2001
		CA 2354510 A1	22.06.2000
		CN 1147486 C	28.04.2004
		CN 1331689 A0	16.01.2002
		DE 69912479 D1	04.12.2003
		DE 69912479 T2	22.07.2004
		DK1149092T3	23.02.2004
		EP 1149092 A2	31.10.2001
		EP 1149092 B1	29.10.2003
		ES 2209527 T3	16.06.2004
		JP 2002-532490 A	02.10.2002
		JP 2002-532490 T	02.10.2002
		KR 10-2001-0087421 A	15.09.2001
		PT1149092E	31.03.2004
		PT1149092T	31.03.2004
		TR200101747 T2	21.11.2001
		WO 00-35906 A3	22.06.2000
		WO 00-35906 A3	09.11.2000