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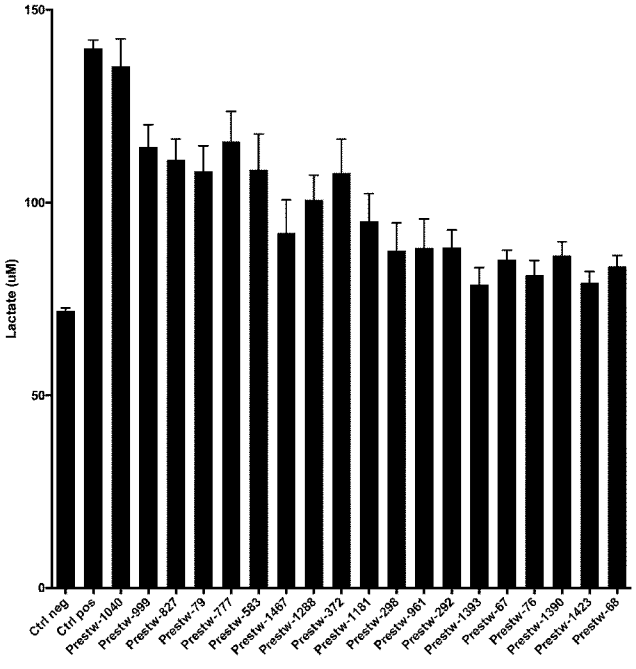
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(54) Title: COMPOSITIONS AND METHODS OF TREATMENT FOR NEUROLOGICAL DISORDERS COMPRISING DEPRESSION

Figure 1



(57) Abstract: This invention, in at least some embodiments, relates to an inventive molecule, compositions comprising same, and methods of use thereof for treatment of a neurological disorder.

[Continued on next page]

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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.

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International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K31/4155 A61K31/416 A61K31/423 A61K31/4245 A61K31/426
A61K31/4545 A61K31/517 A61K31/519 A61K31/55 A61K45/06
A61P25/24 C07D213/42 C07D231/56 C07D261/20 C07D277/04

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)
A61K A61P 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 practicable, search terms used)
EPO-Internal, BIOSIS, EMBASE, 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,P	WO 2019/123378 A1 (GLIAPHARM SA [CH]) 27 June 2019 (2019-06-27) page 55, paragraphs 3rd, 4th pages 78-90; claims 1-5 page 104; claims 19, 20 page 105; claim 25 page 106; claim 26	1-25

X,P	WO 2019/123375 A1 (GLIAPHARM SA [CH]) 27 June 2019 (2019-06-27) pages 79-91; claims 1-5 page 106; claim 21	1-5,16

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[X] Further documents are listed in the continuation of Box C.

[X] 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 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	Date of mailing of the international search report
24 March 2020	23/06/2020

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Opravz, Petra

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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2011/011722 A1 (UNIV VANDERBILT [US]; CONN P JEFFREY [US] ET AL.) 27 January 2011 (2011-01-27) page 121; compound last page 94; claim 1 page 69, paragraph 191 page 125; claim 150 -----	1-25

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/067714

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.:
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 additional 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 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 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.:

1-25(partially)

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-25(partially)

   Compounds of family G, C and E and their medical use

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2. claims: 1-25(partially)

   Compounds of family A, F7, F6 and I and their medical use

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3. claims: 1-25(partially)

   Compounds of family M, PQRV and Y and their medical use

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2019/067714

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2019123378 A1	27-06-2019	AU 2018392987 A1	04-06-2020
		WO 2019123378 A1	27-06-2019
WO 2019123375 A1	27-06-2019	AU 2018392985 A1	04-06-2020
		WO 2019123375 A1	27-06-2019
WO 2011011722 A1	27-01-2011	AU 2010275477 A1	23-02-2012
		BR 112012001532 A2	24-09-2019
		CA 2768832 A1	27-01-2011
		EP 2456310 A1	30-05-2012
		JP 2013500267 A	07-01-2013
		SG 177740 A1	28-02-2012
		US 2012184556 A1	19-07-2012
		WO 2011011722 A1	27-01-2011