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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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,

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

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

- (88) **Date of publication of the international search report:**
27 November 2014

(54) **Title:** INHIBITING NEUROTRANSMITTER REUPTAKE

(57) **Abstract:** This document relates to compounds as well as methods and materials involved in modulating neurotransmitter reuptake. For example, compounds, methods for synthesizing compounds, and methods for inhibiting neurotransmitter reuptake are provided. Specifically gamma-amino alcohol derivatives that inhibit the reuptake of neurotransmitters such as dopamine, serotonin, epinephrine or norepinephrine are provided as therapeutic agents for the treatment of depression or anxiety in a mammalian subject.



INTERNATIONAL SEARCH REPORT

014/022684-18.09.2014

International application No.

PCT/US 14/22684

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(8) - A61K 31/135; A61K 31/165 (2014.01)
 USPC - 514/649; 514/617

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)

IPC(8): A61K 31/135; A61K 31/165 (2014.01)

USPC: 514/649; 514/617

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

USPC: 514/646; 514/653; 514/657; 514/613 ;

CPC: A61K 31/135; A61K 31/165

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

PatBase, Google Scholar, SureChem (structure search), PubWEST

neurotransmitter, dopamine, serotonin, epinephrine, norepinephrine, reuptake, inhibitor, depression, amino alcohol, aminoalcohol, gamma-amino alcohol

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	CARRIER et al. 'Synthesis of a Potent Wide-Spectrum Serotonin-, Norepinephrine-, Dopamine-Reuptake Inhibitor (SNDRI) and a Species-Selective Dopamine-Reuptake Inhibitor Based on the Gamma-Amino Alcohol Functional Group', Bioorganic & Medicinal Chemistry Letters, 1998, Vol.8, pp 487-492. pg 488, Table 1; para 2-4	1-6 and 18 ----- 7, 11-17, (19-20)/(1, 11-18)
X --- Y	SHAW et al. 'Antidepressant-like effects of novel triple reuptake inhibitors, PRC025 and PRC050', European Journal of Pharmacology, 2007, Vol.555, pp 30-36. pg 31, Fig 1	8-10 ----- 11-17, (19-20)/(8-17)
Y	WO 2011/075470 A1 (BERNSTEIN et al.) 23 June 2011 (23.06.2011) para [0038]-[0041], [0046], [0086], [0096]	7, 12-13, 15, (19-20)/(1, 8-18)



Further documents are listed in the continuation of Box C.



* 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

03 August 2014 (03.08.2014)

Date of mailing of the international search report

18 SEP 2014

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
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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.:
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.: 21-26
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 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.:

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.