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(54) Title: SOLID FORMS OF 4-(5-(4-FLUOROPHENYL)-6-TETRAHYDRO-2H-PYRAN-4-YL)- 1,5-DIHYDROPYRROLO[2,3-F]INDAZOL-7-YL)BENZOIC ACID

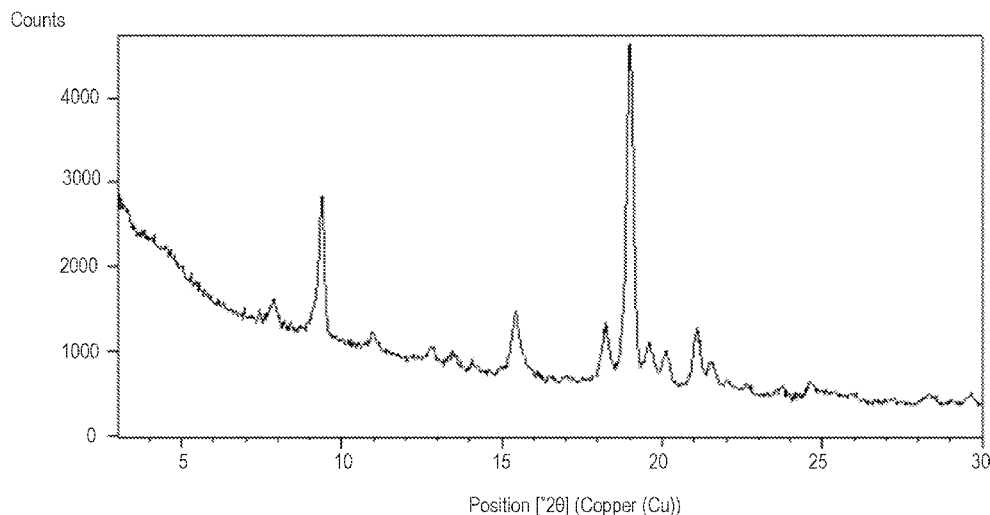


FIG. 1A

(57) Abstract: Solid forms of 4-(5-(4-fluorophenyl)-6-(tetrahydro-2H-pyran-4-yl)-1,5-dihydropyrrolo[2,3-f]indazol-7-yl)benzoic acid (Compound 1) capable of modulating alpha-1 antitrypsin (AAT) activity and methods of treating alpha-1 antitrypsin deficiency (AATD) by administering one or more such forms, and methods of using and preparing the same for treatment of alpha-1 antitrypsin deficiency (AATD).



HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

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- (88) Date of publication of the international search report:**
30 June 2022 (30.06.2022)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2021/072451

A. CLASSIFICATION OF SUBJECT MATTER
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ADD.

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)
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, WPI Data, CHEM ABS Data, EMBASE, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	WO 2021/155087 A1 (VERTEX PHARMA [US]) 5 August 2021 (2021-08-05) pages 3, 4, paragraphs 0009, 0013-0016 page 22, paragraph 0062 Preparation of Compound I; page 38, paragraph 0087 - page 41, paragraph 0099	1-12
A,P	WO 2020/247160 A1 (VERTEX PHARMA [US]) 10 December 2020 (2020-12-10) cited in the application Solid Forms of Compound 33; page 1, paragraph 0002 - 0004; compound 33	1-30, 32-35
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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	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"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 15 March 2022	Date of mailing of the international search report 24/05/2022
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Goss, Ilaria
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INTERNATIONAL SEARCH REPORT

International application No
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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 2020/081257 A1 (VERTEX PHARMA [US]) 23 April 2020 (2020-04-23) abstract Several examples, structurally related to present compound (1) and useful as modulators of AAT activity -----	1-30, 32-35

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2021/072451

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.:
1-30 (completely) ; 32-35 (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: 1-30 (completely); 32-35 (partially)

Solid state Forms of Compound 1 and a solid dispersion comprising it

2. claims: 31 (completely); 32-35 (partially)

A compound represented by structural formulae 1 or 2 different from Compound 1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2021/072451

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		WO 2020081257 A1	23-04-2020
