

PATENT COOPERATION TREATY
PCT
INTERNATIONAL SEARCH REPORT
(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 59541-740601		FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2024/027301	International filing date (<i>day/month/year</i>) 1 May 2024	(Earliest) Priority Date (<i>day/month/year</i>) 2 May 2023	
Applicant RAYZEBIO, INC.			
This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau. This international search report consists of a total of 6 sheets. ☐ It is also accompanied by a copy of each prior art document cited in this report.			
1. Basis of the report a. With regard to the language, the international search was carried out on the basis of: ☒ The international application in the language in which it was filed. ☐ A translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)). b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)). c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I. 2. ☒ Certain claims were found unsearchable (See Box No. II). 3. ☐ Unity of invention is lacking (See Box No. III). 4. With regard to the title, ☒ the text is approved as submitted by the applicant. ☐ the text has been established by this Authority to read as follows: 5. With regard to the abstract, ☒ the text is approved as submitted by the applicant. ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority. 6. With regard to the drawings, a. the figure of the drawings to be published with the abstract is Figure No. 1 ☒ as suggested by the applicant. ☐ as selected by this Authority, because the applicant failed to suggest a figure. ☐ as selected by this Authority, because this figure better characterizes the invention. b. ☐ none of the figures is to be published with the abstract.			

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:
the subject matter listed in Rule 39 on which, under Article 17(2)(a)(i), an international search is not required to be carried out, including
2. ☒ Claims Nos.: **126 & 133**
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:
See Supplemental Box
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. ☐ 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.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2024/027301

A. CLASSIFICATION OF SUBJECT MATTER

C07D 417/14 (2006.01) A61K 51/04 (2006.01) A61P 35/00 (2006.01) C07D 403/14 (2006.01) C07D 413/14 (2006.01)
C07D 513/04 (2006.01) C07D 519/00 (2006.01)

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)

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)

REGISTRY, CAPLUS: Structure search based on generalisation of the examples & keywords carbonic anhydrase IX, CA9, CAIX and like terms.

CAPLUS, MEDLINE, BIOSIS, EMBASE: carbonic anhydrase CA9, CA-IX, radio imaging, tomography, SPECT, DOTA, NOTA, NODAGA, A61K0051-00, dual, multivalent, bifunctional and like terms.

GOOGLE: CAIX, ligand, imaging, dual.

DOCDB, DWPI, ESPACENET, PUBMED, IP Australia internal databases: Applicant/inventor search

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	



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 "D" document cited by the applicant in the international application "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
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Date of the actual completion of the international search 9 August 2024	Date of mailing of the international search report 09 August 2024
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustalia.gov.au	Authorised officer Kate Bryce AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. +61 2 6222 3682

INTERNATIONAL SEARCH REPORT		International application No.
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		PCT/US2024/027301
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CHEN, K.-T. & SEIMBILLE, Y. 'New Developments in Carbonic Anhydrase IX-Targeted Fluorescence and Nuclear Imaging Agents', Int. J. Mol. Sci. 2022, Vol. 23, 6125. See pages 13-18, sections 4.5 & 4.6; page 14, compound 22; & page 17, compounds 33 and 34	
X	WO 2016/196628 A1 (THE JOHNS HOPKINS UNIVERSITY) 08 December 2016 See pages 3-4; XYISMR-01, -04 & -06, pages 13-14; page 30; page 55, lines 18-24; page 56; Examples 3 & 4, pages 71-78; claim 13; page 26; & claim 7	1, 3, 6-15, 17, 18, 21-23, 25, 26, 29-39, 43-55, 58, 62-64, 67-74, 77, 78, 81, 82, 86-100, 102, 103, 106-115, 118, 119, 121-125, 127-132 & 134-139
A	WO 2017/161170 A1 (PURDUE RESEARCH FOUNDATION) 21 September 2017 See abstract; page 7, 2nd and 3rd compounds; & claims 92-102	
E	WO 2024/094827 A1 (PHILOCHEM AG) 10 May 2024 See abstract; Table 4, page 56; e.g. compounds 58-70, 99 & 113, pages 26-38; & page 62, lines 20-27	1-3, 6-8, 12, 17, 21-23, 25, 27, 30-33, 49, 121-123, 125, 127-132 & 134-139

Form PCT/ISA/210 (fifth sheet) (July 2019)

Supplemental Box

Continuation of Box II
The claims do not comply with Rule 6.2(a) because they rely on references to the description and/or drawings.

INTERNATIONAL SEARCH REPORT		International application No.	
Information on patent family members		PCT/US2024/027301	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
WO 2016/196628 A1	08 December 2016	WO 2016196628 A1	08 Dec 2016
		AU 2017263630 A1	22 Nov 2018
		AU 2017263630 B2	04 Nov 2021
		CA 3024097 A1	16 Nov 2017
		CN 109476655 A	15 Mar 2019
		CN 109476655 B	08 Mar 2022
		EP 3455222 A1	20 Mar 2019
		EP 3455222 B1	02 Mar 2022
		JP 2019514984 A	06 Jun 2019
		JP 7030061 B2	04 Mar 2022
		KR 20180136567 A	24 Dec 2018
		KR 102531494 B1	10 May 2023
		US 2018133348 A1	17 May 2018
		US 10857246 B2	08 Dec 2020
		US 2019192699 A1	27 Jun 2019
		WO 2017197251 A1	16 Nov 2017
WO 2017/161170 A1	21 September 2017	WO 2017161170 A1	21 Sep 2017
		AU 2017234676 A1	20 Sep 2018
		CA 3017214 A1	21 Sep 2017
		EP 3429575 A1	23 Jan 2019
		JP 2019512511 A	16 May 2019
		JP 7027325 B2	01 Mar 2022
		US 2019083663 A1	21 Mar 2019
		US 11925696 B2	12 Mar 2024
WO 2024/094827 A1	10 May 2024	WO 2024094827 A1	10 May 2024
End of Annex			
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.			