

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference W2023-7068WO	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2019/049748	International filing date (<i>day/month/year</i>) 5 September 2019 (05-09-2019)	(Earliest) Priority Date (<i>day/month/year</i>) 7 September 2018 (07-09-2018)
Applicant PFIZER 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 5 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 43.6**bis**(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. 3B

- ☒ 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

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/049748

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07K16/28 A61P35/00
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)
C07K A61K A61P

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 2 744 823 A2 (UNIV CALIFORNIA [US]) 25 June 2014 (2014-06-25) the whole document in particular, pages 12-13, 20-21 and 23 -----	1-12, 14-17, 20-47
X	WO 2014/165524 A2 (UNIV CALIFORNIA [US]) 9 October 2014 (2014-10-09)	13,18
Y	the whole document in particular, apges 18-22, 25 and 26 -----	1-12, 14-17, 20-47
Y	WO 2018/064478 A1 (UNIV CALIFORNIA [US]) 5 April 2018 (2018-04-05) the whole document in particular, pages 46-83, 66-67, 69 and 73-77 ----- -/-	1-12, 14-17, 20-47



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 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

4 December 2019

Date of mailing of the international search report

16/12/2019

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

Pérez-Mato, Isabel

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2019/049748

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2015/195835 A2 (UNIV CALIFORNIA [US]; MEDIMMUNE LLC [US]; MEDIMMUNE LTD [GB]) 23 December 2015 (2015-12-23) the whole document in particular, pages 17, 18 and 21 -----	1-12, 14-17, 20-47
Y	WO 2011/020529 A2 (MERCK PATENT GMBH [DE]; GOODMAN SIMON [DE] ET AL.) 24 February 2011 (2011-02-24) the whole document in particular, pages 8, 15, 16 and example 7 -----	1-12, 14-17, 20-30,37
Y	JULIE STOCKIS ET AL: "Blocking immunosuppression by human Tregs in vivo with antibodies targeting integrin [alpha]V[beta]8", PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, vol. 114, no. 47, 6 November 2017 (2017-11-06), pages E10161-E10168, XP055481957, ISSN: 0027-8424, DOI: 10.1073/pnas.1710680114 the whole document in particular, page E10163 and figure 3A -----	1-12, 14-17
Y	Olivier Leger: "Humanization of Antibodies", 12 July 2012 (2012-07-12), XP055032589, Retrieved from the Internet: URL:http://www.icpress.co.uk/etextbook/p74 3/p743_chap01.pdf [retrieved on 2012-07-12] the whole document -----	1-12, 19-26
Y	YAGHOUB SAFDARI ET AL: "Antibody humanization methods - a review and update", BIOTECHNOLOGY AND GENETIC ENGINEERING REVIEWS, vol. 29, no. 2, 1 October 2013 (2013-10-01), pages 175-186, XP055250530, GB ISSN: 0264-8725, DOI: 10.1080/02648725.2013.801235 the whole document ----- -/--	1-12, 19-26

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2019/049748

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	XINHUA WANG ET AL: "IgG Fc engineering to modulate antibody effector functions", PROTEIN & CELL, vol. 9, no. 1, 6 October 2017 (2017-10-06) , pages 63-73, XP055457296, Beijing, CN ISSN: 1674-800X, DOI: 10.1007/s13238-017-0473-8 the whole document in particular, table 1 -----	14
Y	KRISTIAN M. HARGADON ET AL: "Immune checkpoint blockade therapy for cancer: An overview of FDA-approved immune checkpoint inhibitors", INTERNATIONAL IMMUNOPHARMACOLOGY, vol. 62, 1 September 2018 (2018-09-01), pages 29-39, XP055637409, NL ISSN: 1567-5769, DOI: 10.1016/j.intimp.2018.06.001 the whole document in particular, table 1 -----	35,47

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2019/049748

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2744823	A2	25-06-2014	
		AU 2012296362 A1	13-03-2014
		BR 112014003501 A2	01-03-2017
		CA 2846240 A1	21-02-2013
		CN 103857696 A	11-06-2014
		EP 2744823 A2	25-06-2014
		ES 2643397 T3	22-11-2017
		JP 6093360 B2	08-03-2017
		JP 2015501285 A	15-01-2015
		KR 20140054238 A	08-05-2014
		MX 350335 B	04-09-2017
		RU 2014109928 A	27-09-2015
		SG 2014014237 A	30-07-2014
		US 2014271478 A1	18-09-2014
		WO 2013026004 A2	21-02-2013
WO 2014165524	A2	09-10-2014	
		EP 2981554 A2	10-02-2016
		US 2016046717 A1	18-02-2016
		US 2018230217 A1	16-08-2018
		WO 2014165524 A2	09-10-2014
WO 2018064478	A1	05-04-2018	
		AU 2017335991 A1	04-04-2019
		CA 3036232 A1	05-04-2018
		CN 109862913 A	07-06-2019
		EP 3518973 A1	07-08-2019
		US 2019218298 A1	18-07-2019
		WO 2018064478 A1	05-04-2018
WO 2015195835	A2	23-12-2015	
		CN 107405396 A	28-11-2017
		EP 3157561 A2	26-04-2017
		JP 2017522289 A	10-08-2017
		US 2017129955 A1	11-05-2017
		WO 2015195835 A2	23-12-2015
WO 2011020529	A2	24-02-2011	
		AU 2010285265 A1	05-04-2012
		BR 112012003686 A2	29-03-2016
		CA 2771441 A1	24-02-2011
		CN 102597001 A	18-07-2012
		DK 2467401 T3	20-03-2017
		EA 201200281 A1	28-09-2012
		EP 2467401 A2	27-06-2012
		ES 2622487 T3	06-07-2017
		HK 1173455 A1	17-07-2015
		IL 218119 A	31-08-2015
		JP 5734978 B2	17-06-2015
		JP 2013502205 A	24-01-2013
		KR 20120059556 A	08-06-2012
		PT 2467401 T	26-04-2017
		SG 178348 A1	29-03-2012
		US 2012171699 A1	05-07-2012
		US 2013203079 A1	08-08-2013
		WO 2011020529 A2	24-02-2011
		ZA 201201990 B	28-11-2012