

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference PC072772A	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/IB2022/059774	International filing date (<i>day/month/year</i>) 12 October 2022 (12-10-2022)	(Earliest) Priority Date (<i>day/month/year</i>) 15 October 2021 (15-10-2021)
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 43.6bis(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. _____
☐ 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

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Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of a sequence listing:
 - a. ☒ forming part of the international application as filed.
 - b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13*ter*.1(a)).
☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.
2. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this report has been established to the extent that a meaningful search could be carried out without a WIPO Standard ST.26 compliant sequence listing.
3. Additional comments:

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A. CLASSIFICATION OF SUBJECT MATTER INV. A61K39/12 A61P31/20 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) A61K A61P C12N		
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		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2018/170270 A1 (MODERNATX INC [US]) 20 September 2018 (2018-09-20) Example 11; SEQ ID No. 1, 7, 25, 27, 28, 60, 62, 96, 97, 101, 123, 129, 130, 137, 150; Example 13, page 257, lines 2-10; Example 15; Fig. 3; page 165, par. 52 and 70; page 47, line 29 to page 48, line 23 and claim 50; Example 14 -----	1-32
X	WO 2017/070601 A1 (MODERNATX INC [US]) 27 April 2017 (2017-04-27) the whole document ----- -----	1-32
-/--		
☒ 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		Date of mailing of the international search report
15 December 2022		24/01/2023
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 Marinoni J-C

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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.
X	MONSLOW MORGAN A ET AL: "Immunogenicity generated by mRNA vaccine encoding VZV gE antigen is comparable to adjuvanted subunit vaccine and better than live attenuated vaccine in nonhuman primates", VACCINE, ELSEVIER, AMSTERDAM, NL, vol. 38, no. 36, 20 July 2020 (2020-07-20), pages 5793-5802, XP086228885, ISSN: 0264-410X, DOI: 10.1016/J.VACCINE.2020.06.062 [retrieved on 2020-07-20] The whole document, particularly paragraph 2.1 -----	1-32
X	WO 2020/246750 A2 (CATHOLIC UNIV KOREA IND ACADEMIC COOPERATION FOUNDATION [KR] ET AL.) 10 December 2020 (2020-12-10) Preparation Example 14; paragraphs [0049], [0084], [0088] - [0091], [0097] - [0098]; example 8; table 6 -----	1-6, 12, 25-29, 31, 32
A	CHEN SAM ET AL: "Dexamethasone prodrugs as potent suppressors of the immunostimulatory effects of lipid nanoparticle formulations of nucleic acids", JOURNAL OF CONTROLLED RELEASE, ELSEVIER, AMSTERDAM, NL, vol. 286, 17 July 2018 (2018-07-17), pages 46-54, XP085477984, ISSN: 0168-3659, DOI: 10.1016/J.JCONREL.2018.07.026 -----	1-32
A	EYGERIS YULIA ET AL: "Deconvoluting Lipid Nanoparticle Structure for Messenger RNA Delivery", NANO LETTERS, vol. 20, no. 6, 6 May 2020 (2020-05-06), pages 4543-4549, XP055966334, US ISSN: 1530-6984, DOI: 10.1021/acs.nanolett.0c01386 -----	1-32
A	JUSTIN M. RICHNER ET AL: "Modified mRNA Vaccines Protect against Zika Virus Infection", CELL, vol. 168, no. 6, 1 March 2017 (2017-03-01), pages 1114-1125.e10, XP055550333, Amsterdam NL ISSN: 0092-8674, DOI: 10.1016/j.cell.2017.02.017 Page e2, Method details, the paragraph titled "Generation of modified mRNA and LNP") -----	1-32

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2018170270 A1	20-09-2018	US 2020069793 A1 WO 2018170270 A1	05-03-2020 20-09-2018
WO 2017070601 A1	27-04-2017	AU 2016342371 A1 BR 112018008051 A2 CA 3002912 A1 CL 2018001051 A1 CN 108472309 A CO 2018005265 A2 EA 201891001 A1 EP 3364980 A1 IL 258827 A JP 6925688 B2 JP 2018536022 A JP 2021121630 A KR 20180094859 A MA 46080 A PE 20181529 A1 PH 12018500858 A1 SG 11201803360U A TN 2018000152 A1 TW 201729838 A WO 2017070601 A1	07-06-2018 13-11-2018 27-04-2017 19-10-2018 31-08-2018 22-11-2018 30-11-2018 29-08-2018 28-06-2018 25-08-2021 06-12-2018 26-08-2021 24-08-2018 10-07-2019 26-09-2018 29-10-2018 30-05-2018 04-10-2019 01-09-2017 27-04-2017
WO 2020246750 A2	10-12-2020	KR 20200140494 A US 2022233700 A1 WO 2020246750 A2	16-12-2020 28-07-2022 10-12-2020