

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 123429-08320	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2020/039359	International filing date (<i>day/month/year</i>) 24 June 2020 (24-06-2020)	(Earliest) Priority Date (<i>day/month/year</i>) 27 June 2019 (27-06-2019)
Applicant BIOGEN MA 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 4 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. _____

☐

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/US2020/039359

A. CLASSIFICATION OF SUBJECT MATTER INV. C07D471/04 C07D487/04 C07D519/00 A61P11/00 A61K31/437 A61K31/519 A61P17/00 A61P19/00 A61P25/00 A61P29/00 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) A61P C07D A61K 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, EMBASE, WPI Data											
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td> WO 03/070732 A1 (UPJOHN CO [US]; ROGERS BRUCE N [US] ET AL.) 28 August 2003 (2003-08-28) compounds with the Registry Numbers 588721-24-8, 588721-25-9, 588721-26-0, 588722-08-1, 588722-09-2, 588722-10-5, 588722-96-7, 588722-97-8, 588722-98-9, 588723-42-6, 588723-43-7, 588723-44-8, 588724-71-4, 588724-72-5, 588724-73-6, 588725-18-2, 588725-19-3, 588725-20-6, 588726-48-1, 588726-49-2 and 588726-50-5; claims 1, 8, 65, 81 ----- </td> <td> 1,2,9, 20,22, 36-40 </td> </tr> <tr> <td>X</td> <td> WO 2018/234343 A1 (HOFFMANN LA ROCHE [CH]; GENENTECH INC [US]) 27 December 2018 (2018-12-27) page 96; claims 1, 19-22, 24, 30; example 65 ----- -/-- </td> <td> 1-40 </td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	WO 03/070732 A1 (UPJOHN CO [US]; ROGERS BRUCE N [US] ET AL.) 28 August 2003 (2003-08-28) compounds with the Registry Numbers 588721-24-8, 588721-25-9, 588721-26-0, 588722-08-1, 588722-09-2, 588722-10-5, 588722-96-7, 588722-97-8, 588722-98-9, 588723-42-6, 588723-43-7, 588723-44-8, 588724-71-4, 588724-72-5, 588724-73-6, 588725-18-2, 588725-19-3, 588725-20-6, 588726-48-1, 588726-49-2 and 588726-50-5; claims 1, 8, 65, 81 -----	1,2,9, 20,22, 36-40	X	WO 2018/234343 A1 (HOFFMANN LA ROCHE [CH]; GENENTECH INC [US]) 27 December 2018 (2018-12-27) page 96; claims 1, 19-22, 24, 30; example 65 ----- -/--	1-40
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.									
X	WO 03/070732 A1 (UPJOHN CO [US]; ROGERS BRUCE N [US] ET AL.) 28 August 2003 (2003-08-28) compounds with the Registry Numbers 588721-24-8, 588721-25-9, 588721-26-0, 588722-08-1, 588722-09-2, 588722-10-5, 588722-96-7, 588722-97-8, 588722-98-9, 588723-42-6, 588723-43-7, 588723-44-8, 588724-71-4, 588724-72-5, 588724-73-6, 588725-18-2, 588725-19-3, 588725-20-6, 588726-48-1, 588726-49-2 and 588726-50-5; claims 1, 8, 65, 81 -----	1,2,9, 20,22, 36-40									
X	WO 2018/234343 A1 (HOFFMANN LA ROCHE [CH]; GENENTECH INC [US]) 27 December 2018 (2018-12-27) page 96; claims 1, 19-22, 24, 30; example 65 ----- -/--	1-40									
☒ 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 September 2020		Date of mailing of the international search report 18/09/2020									
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 Moriggi, J									

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2020/039359

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2017/305901 A1 (SHILATIFARD ALI [US] ET AL) 26 October 2017 (2017-10-26) claims 1, 3, 12, 15 -----	1-40
A	WILLIAM T. MCELROY: "Interleukin-1 receptor-associated kinase 4 (IRAK4) inhibitors: an updated patent review (2016-2018)", EXPERT OPINION ON THERAPEUTIC PATENTS, vol. 29, no. 4, 29 March 2019 (2019-03-29), pages 243-259, XP055727413, ISSN: 1354-3776, DOI: 10.1080/13543776.2019.1597850 figures 1-15 -----	1-40

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2020/039359

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03070732	A1	28-08-2003	AU 2003219690 A1 09-09-2003 BR 0307735 A 25-01-2005 CA 2476681 A1 28-08-2003 EP 1476449 A1 17-11-2004 JP 2005523288 A 04-08-2005 MX PA04008038 A 26-11-2004 US 2003236264 A1 25-12-2003 US 2005215584 A1 29-09-2005 WO 03070732 A1 28-08-2003
WO 2018234343	A1	27-12-2018	CN 110770229 A 07-02-2020 EP 3642199 A1 29-04-2020 JP 2020524692 A 20-08-2020 US 2020115388 A1 16-04-2020 WO 2018234343 A1 27-12-2018
US 2017305901	A1	26-10-2017	US 2017305901 A1 26-10-2017 US 2018319795 A1 08-11-2018