

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 09-0697-WO-1	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2020/039477	International filing date (<i>day/month/year</i>) 25 June 2020 (25-06-2020)	(Earliest) Priority Date (<i>day/month/year</i>) 27 June 2019 (27-06-2019)
Applicant BOEHRINGER INGELHEIM INTERNATIONAL GMBH		

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 8 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. 2
☐ 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:
- ☒ in the form of an Annex C/ST.25 text file.
- ☐ on paper or in the form of an image file.
- b. ☐ furnished together with the international application under PCT Rule 13~~ter~~.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
- c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
- ☐ in the form of an Annex C/ST.25 text file (Rule 13~~ter~~.1(a)).
- ☐ on paper or in the form of an image file (Rule 13~~ter~~.1(b) and Administrative Instructions, Section 713).
2. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
3. Additional comments:

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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.:

1-17(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.

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A. CLASSIFICATION OF SUBJECT MATTER		
INV.	C07K16/22 A61K39/395	A61P33/00 A61P11/00 A61P9/00 A61P13/12
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 A61P 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, BIOSIS, Sequence Search, EMBASE		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KYRIAKOS P. PAPADOPOULOS ET AL: "A Phase I First-in-Human Study of Nesvacumab (REGN910), a Fully Human Anti-Angiopoietin-2 (Ang2) Monoclonal Antibody, in Patients with Advanced Solid Tumors", CLINICAL CANCER RESEARCH, vol. 22, no. 6, 21 October 2015 (2015-10-21), pages 1348-1355, XP055728926, US ISSN: 1078-0432, DOI: 10.1158/1078-0432.CCR-15-1221 abstract	1-17
X	EP 2 832 746 A1 (SAMSUNG ELECTRONICS CO LTD [KR]) 4 February 2015 (2015-02-04) claims 1-8	1-17
----- -/-		
☒ 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 10 September 2020		Date of mailing of the international search report 12/11/2020
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 Fleitmann, J

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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	WO 2015/091655 A1 (HOFFMANN LA ROCHE [CH]; HOFFMANN LA ROCHE [US]) 25 June 2015 (2015-06-25) claims 1-15 -----	1-17
X	WO 2013/134516 A1 (MEDIMMUNE LLC [US]; ALITALO KARI [FI] ET AL.) 12 September 2013 (2013-09-12) example 12 -----	1-17

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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
EP 2832746	A1	04-02-2015	EP 2832746 A1 04-02-2015
			EP 2835380 A1 11-02-2015
			EP 3381940 A1 03-10-2018
			US 2015030603 A1 29-01-2015
			US 2015030604 A1 29-01-2015
			US 2018086825 A1 29-03-2018

WO 2015091655	A1	25-06-2015	AU 2014368695 A1 14-04-2016
			CA 2923591 A1 25-06-2015
			CL 2016001586 A1 12-05-2017
			CN 105611944 A 25-05-2016
			CR 20160199 A 17-06-2016
			EA 201600474 A1 30-11-2016
			EP 3082857 A1 26-10-2016
			HK 1221409 A1 02-06-2017
			JP 6345787 B2 20-06-2018
			JP 2017504600 A 09-02-2017
			KR 20160085888 A 18-07-2016
			PE 20160753 A1 01-08-2016
			PH 12016500482 A1 16-05-2016
			SG 11201604594S A 28-07-2016
			TW 201526915 A 16-07-2015
			US 2015232548 A1 20-08-2015
			US 2018134780 A1 17-05-2018
			US 2020199215 A1 25-06-2020
			WO 2015091655 A1 25-06-2015
			ZA 201601895 B 28-11-2018

WO 2013134516	A1	12-09-2013	AU 2013230750 A1 02-10-2014
			EP 2822594 A1 14-01-2015
			US 2015044227 A1 12-02-2015
			US 2016222099 A1 04-08-2016
			US 2018215818 A1 02-08-2018
			WO 2013134516 A1 12-09-2013

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-17(partially)

An anti-ANGPT2 antibody or an antigen-binding fragment comprising: a heavy chain variable region comprising the amino acid sequence of SEQ ID NO. 13 (H-CDR1); the amino acid sequence of SEQ ID NO. 15 (H-CDR2); and the amino acid sequence of SEQ ID NO. 17 (H-CDR3), and a light chain variable region comprising the amino acid sequence of SEQ ID NO. 19 (L-CDR1); the amino acid sequence of SEQ ID NO. 22 (L-CDR2); and the amino acid sequence of SEQ ID NO. 24 (L-CDR3).

2. claims: 1-17(partially)

An anti-ANGPT2 antibody or an antigen-binding fragment comprising: a heavy chain variable region comprising the amino acid sequence of SEQ ID NO. 14 (H-CDR1); the amino acid sequence of SEQ ID NO. 15 (H-CDR2); and the amino acid sequence of SEQ ID NO. 17 (H-CDR3); and a light chain variable region comprising the amino acid sequence of SEQ ID NO. 19 (L-CDR1); the amino acid sequence of SEQ ID NO. 22 (L-CDR2); and the amino acid sequence of SEQ ID NO. 24 (L-CDR3),

3. claims: 1-17(partially)

An anti-ANGPT2 antibody or an antigen-binding fragment comprising: a heavy chain variable region comprising the amino acid sequence of SEQ ID NO. 13 (H-CDR1); the amino acid sequence of SEQ ID NO. 15 (H-CDR2); and the amino acid sequence of SEQ ID NO. 16 (H-CDR3); and a light chain variable region comprising the amino acid sequence of SEQ ID NO. 20 (L-CDR1); the amino acid sequence of SEQ ID NO. 23 (L-CDR2); and the amino acid sequence of SEQ ID NO. 24 (L-CDR3),

4. claims: 1-17(partially)

An anti-ANGPT2 antibody or an antigen-binding fragment comprising: a heavy chain variable region comprising the amino acid sequence of SEQ ID NO. 13 (H-CDR1); the amino acid sequence of SEQ ID NO. 15 (H-CDR2); and the amino acid sequence of SEQ ID NO. 16 (H-CDR3); and a light chain variable region comprising the amino acid sequence of SEQ ID NO. 21 (L-CDR1); the amino acid sequence of SEQ ID NO. 23 (L-CDR2); and the amino acid sequence of SEQ ID NO. 25 (L-CDR3),

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

5. claims: 1-17(partially)

An anti-ANGPT2 antibody or an antigen-binding fragment comprising: a heavy chain variable region comprising the amino acid sequence of SEQ ID NO. 13 (H-CDR1); the amino acid sequence of SEQ ID NO. 15 (H-CDR2); and the amino acid sequence of SEQ ID NO. 16 (H-CDR3); and a light chain variable region comprising the amino acid sequence of SEQ ID NO. 20 (L-CDR1); the amino acid sequence of SEQ ID NO. 22 (L-CDR2); and the amino acid sequence of SEQ ID NO. 24 (L-CDR3).
