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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

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(54) Title: ANTI-CD161 ANTIBODIES AND METHODS OF USE THEREOF

(57) Abstract: The present disclosure provides antibodies and antigen-binding portions thereof that bind CD161, bispecific antibodies and multispecific antibodies comprising the same, nucleic acids and vectors encoding the same, and methods of using the same to treat a subject in need thereof.



WO 2024/229461 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2024/028001

A. CLASSIFICATION OF SUBJECT MATTER INV. C07K16/28 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		
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		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2021/080682 A1 (MASSACHUSETTS INST TECHNOLOGY [US]; DANA FARBER CANCER INST INC [US]) 29 April 2021 (2021-04-29) examples 6,7; tables 5-8 -----	1-15, 17-40
X	US 2021/363260 A1 (SUVA MARIO [US] ET AL) 25 November 2021 (2021-11-25) claims 1, 2, 8; example 5 -----	1-15, 17-40
X	WO 2023/028501 A1 (IMMUNITAS THERAPEUTICS INC [US]) 2 March 2023 (2023-03-02) examples 1,5,10,17; tables 6,12,17 -----	1-15, 17-40
☐ 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 18 September 2024		Date of mailing of the international search report 26/11/2024
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 Saame, Tina

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2024/028001

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:

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2024/028001

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.: **16 (completely); 1-6, 8-13, 15, 17-40 (partially)**
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 FURTHER INFORMATION sheet PCT/ISA/210

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.:
1-15, 17-40 (all 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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-15, 17-40 (all partially)

An antibody or an antigen-binding portion thereof that specifically binds CD161, comprising a heavy chain variable region (VH) and a light chain variable region (VL), comprising a VH-CDR1 comprising the amino acid sequence set forth in SEQ ID NO: 211, a VH-CDR2 comprising the amino acid sequence set forth in SEQ ID NO: 212, a VH-CDR3 comprising the amino acid sequence set forth in SEQ ID NO: 213, a VL-CDR1 comprising the amino acid sequence set forth in SEQ ID NO: 214, a VL-CDR2 comprising the amino acid sequence set forth in SEQ ID NO: 215, and a VL-CDR3 comprising the amino acid sequence set forth in SEQ ID NO: 216 (option (v) of claim 7; CDRs of exemplified antibody 09013).

2-10. claims: 1-15, 17-40 (all partially)

An antibody or an antigen-binding portion thereof that specifically binds CD161, comprising a heavy chain variable region (VH) and a light chain variable region (VL), comprising a set of VH-CDR1, VH-CDR2, VH-CDR3, VL-CDR1, VL-CDR2 and VL-CDR3 as set out under option (i) of claim 7 (invention 2) and any of the sets of VH-CDR1, VH-CDR2, VH-CDR3, VL-CDR1, VL-CDR2 and VL-CDR3 as set out under options (ii)-(iv) and (vi)-(x) of claim 7 (inventions 3-5 and 6-10).

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 16 (completely); 1-6, 8-13, 15, 17-40 (partially)

The search is limited to an antibody according to claim 7(v), i.e. an antibody comprising SEQ ID Nos 211-216 (the six CDR sequences of the 09013 antibody). The reasons for the limitation of search are as set out in the accompanying written opinion of the international searching authority.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.3), should the problems which led to the Article 17(2) PCT declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2024/028001

Patent document cited in search report			Publication date		Patent family member(s)			Publication date	
WO 2021080682	A1	29-04-2021	US	2021122826	A1	29-04-2021			
			WO	2021080682	A1	29-04-2021			

US 2021363260	A1	25-11-2021	EP	3710039	A1	23-09-2020			
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			JP	2024534265	A	18-09-2024			
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			US	2024279346	A1	22-08-2024			
			WO	2023028501	A1	02-03-2023			
