

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2019/014061

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.: **15, 16**
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 15 and 16 pertain to a method for treatment of the human body by therapy, and thus pertain to a subject matter on which the International Searching Authority is not required to carry out an international search under the provisions of PCT Article 17(2)(a)(i) and PCT Rule 39.1(iv).
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:

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 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.:

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

A61K 38/48(2006.01)i, A61K 31/7088(2006.01)i, A61K 48/00(2006.01)i, A61P 19/02(2006.01)i, A61P 19/08(2006.01)i

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 38/48; A61K 45/06; C12N 5/077; A61K 31/7088; A61K 48/00; A61P 19/02; A61P 19/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models: IPC as above

Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & Keywords: USP25, tissue regeneration, cartilage, bone

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	ZHONG, B. et al. Negative regulation of IL-17-mediated signaling and inflammation by the ubiquitin-specific protease USP25. <i>Nature Immunology</i> . November 2012, vol. 13, no. 11, pages 1110-1117 See abstract; page 2; figure 1.	1-14
Y	KONDO, M. et al. IL-17 inhibits chondrogenic differentiation of human mesenchymal stem cells. <i>PLoS One</i> . 15 November 2013, vol. 8, no. 11, e79463 (pages 1-9) See abstract; page 8.	1-4,6-10,12-14
Y	WANG, Z. et al. IL-17A inhibits osteogenic differentiation of bone mesenchymal stem cells via Wnt signaling pathway. <i>Medical Science Monitor</i> . 24 August 2017, vol. 23, pages 4095-4101 See abstract; page 4100, right column; figure 1.	1-3,5-9,11-14
A	GUO, Y.-C. et al. Deubiquitinating enzymes and bone remodeling. <i>Stem Cells International</i> . 08 July 2018, vol. 2018, thesis ID 3712083 (pages 1-9) See the entire document.	1-14



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

21 FEBRUARY 2020 (21.02.2020)

Date of mailing of the international search report

21 FEBRUARY 2020 (21.02.2020)

Name and mailing address of the ISA/KR

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PCT/KR2019/014061

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SURESH, B. et al. Regulation of pluripotency and differentiation by deubiquitinating enzymes. <i>Cell Death & Differentiation</i> . (Electronic publication) 10 June 2016, vol. 231, pages 1257-1264 See the entire document.	1-14
A	US 2015-0307846 A1 (UNIVERSITY OF PENNSYLVANIA et al.) 29 October 2015 See the entire document.	1-14
PX	BAEK, Daun. Deubiquitinase USP25 is essential for chondrogenic differentiation of human bone marrow derived mesenchymal stem cells. In: 대한 운동계 줄기세포 재생의 학회 제11회 학술대회. 19 May 2019, 강남세브란스 병원, 서울 (In: Korean Society of Stem Cell and Regenerative Medicine for Locomotor System 11th Conference. Gangnam Severance Hospital, Seoul.) See the entire document.	1-4,6-10,12-14

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2019/014061

Patent document cited in search report	Publication date	Patent family member	Publication date
US 2015-0307846 A1	29/10/2015	EP 2861720 A1 WO 2013-189975 A1	22/04/2015 27/12/2013