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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
27 June 2019 (27.06.2019)

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(54) Title: METHODS AND COMPOSITIONS FOR THE TREATMENT OF WOUNDS

(57) Abstract: The methods and compositions described herein address the need in the art by providing peptides and polypeptides comprising a growth factor binding domain. In some embodiments, the peptides have an amino acid sequence that is at least 80% identical to one of SEQ ID NOS:1-7, 13-15, 49-50, or 66-70, or a fragment thereof; wherein the peptide is less than 300 amino acids in length.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/060760

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07K4/00 C07K4/12
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

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, 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	US 2008/233125 A1 (PETER MARINKOVICH M [US]) 25 September 2008 (2008-09-25) abstract paragraph [0008] paragraph [0048] paragraph [0060] sequence 19 -----	1-6, 10-87
T	JUN ISHIHARA ET AL: "Laminin heparin-binding peptides bind to several growth factors and enhance diabetic wound healing", NATURE COMMUNICATIONS, vol. 9, no. 1, 4 June 2018 (2018-06-04), XP055568823, DOI: 10.1038/s41467-018-04525-w the whole document -----	1-6, 10-87
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[X] Further documents are listed in the continuation of Box C.

[X] 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
14 March 2019	28/05/2019

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Keller, Yves

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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Maniraj Bhagawati ET AL: "Biofunctionalization of Hydrogels for Engineering the Cellular Microenvironment" In: "Micro- and Nanoengineering of the Cell Surface", 1 January 2014 (2014-01-01), Elsevier, XP055568583, ISBN: 978-1-4557-3146-6 pages 315-348, DOI: 10.1016/B978-1-4557-3146-6.00014-3, abstract paragraph [14.1] paragraph [14.2.1] - paragraph [14.2.2] figure 2 paragraph [14.2.3.2] paragraph [14.5]	1-6, 10-87
X	MIKAÃ<L M. MARTINO ET AL: "Extracellular Matrix and Growth Factor Engineering for Controlled Angiogenesis in Regenerative Medicine", FRONTIERS IN BIOENGINEERING AND BIOTECHNOLOGY, vol. 3, 1 April 2015 (2015-04-01), XP055568819, DOI: 10.3389/fbioe.2015.00045 abstract page 3, column 2, paragraph 3 - page 5, column 1, paragraph 1 figure 2	1-6, 10-87
X	MITCHELL AARON C ET AL: "Engineering growth factors for regenerative medicine applications", ACTA BIOMATERIALIA, ELSEVIER, AMSTERDAM, NL, vol. 30, 7 November 2015 (2015-11-07), pages 1-12, XP029364329, ISSN: 1742-7061, DOI: 10.1016/J.ACTBIO.2015.11.007 the whole document	1-6, 10-87
T	LAURA DE LAPORTE ET AL: "Tenascin C Promiscuously Binds Growth Factors via Its Fifth Fibronectin Type III-Like Domain", PLOS ONE, vol. 8, no. 4, 18 April 2013 (2013-04-18), page e62076, XP055568815, DOI: 10.1371/journal.pone.0062076 the whole document	

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/060760

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	M. M. MARTINO ET AL: "Heparin-binding domain of fibrin(ogen) binds growth factors and promotes tissue repair when incorporated within a synthetic matrix", PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol. 110, no. 12, 4 March 2013 (2013-03-04), pages 4563-4568, XP055372533, US ISSN: 0027-8424, DOI: 10.1073/pnas.1221602110 the whole document -----	
T	SCHENSE J C ET AL: "CROSS-LINKING EXOGENOUS BIFUNCTIONAL PEPTIDES INTO FIBRIN GELS WITHFACTOR XIIIA", BIOCONJUGATE CHEMISTRY, AMERICAN CHEMICAL SOCIETY, US, vol. 10, no. 1, 1 January 1999 (1999-01-01), pages 75-81, XP000867031, ISSN: 1043-1802, DOI: 10.1021/BC9800769 the whole document -----	

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/060760

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.:

1-6, 10-87(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: 1-6, 10-87(all partially)

   A peptide comprising a growth factor binding domain of SEQ ID No 1 and directly related subject matter

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2. claims: 1-6, 10-87(all partially)

   A peptide comprising a growth factor binding domain of SEQ ID No 2 and directly related subject matter

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3. claims: 1-6, 10-87(all partially)

   A peptide comprising a growth factor binding domain of SEQ ID No 3 and directly related subject matter

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4. claims: 1-6, 10-87(all partially)

   A peptide comprising a growth factor binding domain of SEQ ID No 4 and directly related subject matter

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5. claims: 1-6, 10-87(all partially)

   A peptide comprising a growth factor binding domain of SEQ ID No 5 and directly related subject matter

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6. claims: 1-6, 10-87(all partially)

   A peptide comprising a growth factor binding domain of SEQ ID No 6 and directly related subject matter

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7. claims: 1-6, 10-87(all partially)

   A peptide comprising a growth factor binding domain of SEQ ID No 7 and directly related subject matter

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8. claims: 1-6, 10-87(all partially)

   A peptide comprising a growth factor binding domain of SEQ ID No 13 and directly related subject matter

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9. claims: 1-6, 10-87(all partially)

   A peptide comprising a growth factor binding domain of SEQ ID No 14 and directly related subject matter

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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10. claims: 1-6, 10-87(all partially)

A peptide comprising a growth factor binding domain of SEQ ID No 15 and directly related subject matter

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11. claims: 1-89(partially)

A peptide comprising a growth factor binding domain of SEQ ID No 49 and directly related subject matter

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12. claims: 1-89(partially)

A peptide comprising a growth factor binding domain of SEQ ID No 50 and directly related subject matter

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13. claims: 1-6, 10-87(all partially)

A peptide comprising a growth factor binding domain of SEQ ID No 68 and directly related subject matter

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14. claims: 1-6, 10-87(all partially)

A peptide comprising a growth factor binding domain of SEQ ID No 69 and directly related subject matter

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15. claims: 1-6, 10-87(all partially)

A peptide comprising a growth factor binding domain of SEQ ID No 70 and directly related subject matter

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16. claims: 1-6, 10-89(all partially)

A peptide comprising a growth factor binding domain of SEQ ID No 66 and directly related subject matter

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17. claims: 1-6, 10-87(all partially)

A peptide comprising a growth factor binding domain of SEQ ID No 70 and directly related subject matter

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2018/060760

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008233125 A1	25-09-2008	NONE	