

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference PA44829WO1/BAF	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/GB2024/050364	International filing date (<i>day/month/year</i>) 9 February 2024 (09-02-2024)	(Earliest) Priority Date (<i>day/month/year</i>) 9 February 2023 (09-02-2023)
Applicant PETMEDIX LTD		

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 10 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 43.6bis(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:

THERAPEUTIC MOLECULES COMPRISING VARIANTS OF THE EXTRACELLULAR DOMAIN OF P75 NEUROTROPHIN RECEPTOR (P75NTR)

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. 1
☒ 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.
 - 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:

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

The present invention relates to effective therapies for pain, inflammation and osteoarthritis, especially in companion animals, like dogs. The invention provides an isolated polypeptide comprising a variant p75 neurotrophin receptor (p75NTR) extracellular domain or a fusion protein containing the same or portions thereof, especially to an Fc domain. Nucleic acids encoding the proteins are also encompassed in the invention as well as methods of using the same.

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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.:

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. C07K14/705 A61K38/00 A61P19/02 A61P25/04 A61P29/00 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 A61P		
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, COMPENDEX, Sequence Search, EMBASE, FSTA, INSPEC, 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	WO 2022/226170 A1 (UNIV CORNELL [US]; ALBERT EINSTEIN COLLEGE OF MEDICINE [US] ET AL.) 27 October 2022 (2022-10-27)	1-34
Y	the whole document Fig. 3A-3D; Examples; SEQ ID NO: 8; claims 13-15; page 18, lines 19-35; pages 17-19; ----- -/--	1-34
☒ 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 11 April 2024		Date of mailing of the international search report 30/04/2024
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 Madruga, Jaime

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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.
Y	WO 2020/191289 A1 (KINDRED BIOSCIENCES INC [US]) 24 September 2020 (2020-09-24) the whole document [0027], [0028], [0032] [0188]; claims 50-51; [0032]; [0186], claims 64-68, claim 22 -----	1-34
Y	WO 2016/146841 A1 (LEVICEPT LTD [GB]) 22 September 2016 (2016-09-22) the whole document claims, examples; claim 5; page 11, lines 27-29 -----	1-34
Y	WO 2015/040398 A1 (LEVICEPT LTD [GB]) 26 March 2015 (2015-03-26) the whole document Fig. 5; page 6, para. 2; claims 9, 12, 17; page 26, para 6 to p. 27, para. 1; p. 20, "Epibase™ Immune profiling"; page 22 "p75-NTR Fc-Fusion Protein Design"; Fig. 5 -----	1-34
Y	WO 2013/136078 A1 (LEVICEPT LTD [GB]) 19 September 2013 (2013-09-19) the whole document page 10, lines 28-33, claim 18; page 16, lines 20-21; page 6, lines 13-30.; claims 25,27; sequences 2,3,12,17 -----	1-34
Y	WO 2020/082048 A1 (KINDRED BIOSCIENCES INC [US]) 23 April 2020 (2020-04-23) the whole document [0002], [0005]; Claims Claims 25, 27, [0121], [0123] -----	1-34
X	DATABASE UNIPROT [Online] 14 December 2022 (2022-12-14), Anonymous: "Nerve growth factor receptor L homeolog precursor; p75 neurotrophin receptor a-1; p75 neurotrophin receptor a-2", XP093149849, retrieved from EBI accession no. UNIPROT:Q9PRG7_XENLA Database accession no. Q9PRG7_XENLA abstract -----	1,4-6,13
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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	-& HUTSON LARA D. ET AL: "Expression and function of <i>Xenopus laevis</i> p75 NTR suggest evolution of developmental regulatory mechanisms", JOURNAL OF NEUROBIOLOGY, vol. 49, no. 2, 27 September 2001 (2001-09-27), pages 79-98, XP093149848, US ISSN: 0022-3034, DOI: 10.1002/neu.1067 -----	1, 4-6, 13

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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
WO 2022226170	A1	27-10-2022	NONE
WO 2020191289	A1	24-09-2020	AU 2020240120 A1 30-09-2021 CA 3133104 A1 24-09-2020 CN 113840831 A 24-12-2021 EP 3941933 A1 26-01-2022 JP 2022525754 A 19-05-2022 KR 20220066002 A 23-05-2022 US 2022169740 A1 02-06-2022 WO 2020191289 A1 24-09-2020
WO 2016146841	A1	22-09-2016	US 2018170995 A1 21-06-2018 WO 2016146841 A1 22-09-2016
WO 2015040398	A1	26-03-2015	AU 2014322842 A1 07-04-2016 BR 112016006113 A2 26-09-2017 CA 2924410 A1 26-03-2015 CN 105873943 A 17-08-2016 CY 1121347 T1 29-05-2020 DK 3046934 T3 08-04-2019 EA 201690469 A1 30-12-2016 EP 3046934 A1 27-07-2016 ES 2714694 T3 29-05-2019 HR P20190434 T1 19-04-2019 HU E043273 T2 28-08-2019 JP 6681834 B2 15-04-2020 JP 7357088 B2 05-10-2023 JP 2016531590 A 13-10-2016 JP 2020062011 A 23-04-2020 JP 2022068253 A 09-05-2022 KR 20160058872 A 25-05-2016 LT 3046934 T 25-03-2019 NZ 718044 A 31-07-2020 PL 3046934 T3 31-05-2019 PT 3046934 T 25-03-2019 SG 11201602068Q A 28-04-2016 SI 3046934 T1 30-04-2019 TR 201903490 T4 21-03-2019 US 2016222082 A1 04-08-2016 US 2018273603 A1 27-09-2018 US 2021238256 A1 05-08-2021 WO 2015040398 A1 26-03-2015
WO 2013136078	A1	19-09-2013	AU 2013234083 A1 04-09-2014 BR 112014022708 A2 20-06-2017 CA 2866463 A1 19-09-2013 CN 104302326 A 21-01-2015 CO 7081145 A2 10-10-2014 CY 1119213 T1 14-02-2018 DK 2825208 T3 11-09-2017 EA 201491550 A1 30-12-2014 EP 2825208 A1 21-01-2015 ES 2637341 T3 11-10-2017 HK 1205693 A1 24-12-2015 HR P20171255 T1 20-10-2017 JP 6242350 B2 06-12-2017 JP 2015511490 A 20-04-2015 KR 20140120926 A 14-10-2014

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Information on patent family members

International application No

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		LT 2825208 T	25-09-2017
		MX 350312 B	01-09-2017
		NZ 628685 A	22-12-2017
		PH 12014501736 A1	10-11-2014
		PL 2825208 T3	31-10-2017
		PT 2825208 T	25-08-2017
		SG 10201705725X A	30-08-2017
		SG 11201404920V A	27-11-2014
		SI 2825208 T1	30-10-2017
		US 2015037335 A1	05-02-2015
		US 2018161392 A1	14-06-2018
		US 2021060123 A1	04-03-2021
		WO 2013136078 A1	19-09-2013
		ZA 201405627 B	27-09-2017

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		BR 112021006977 A2	27-07-2021
		CA 3114796 A1	23-04-2020
		CN 113194984 A	30-07-2021
		EP 3866842 A1	25-08-2021
		JP 2022504868 A	13-01-2022
		KR 20210110563 A	08-09-2021
		US 2021388053 A1	16-12-2021
		WO 2020082048 A1	23-04-2020

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-34

An isolated polypeptide comprising a companion animal p75neurotrophin receptor (p75NTR) extracellular domain, wherein said p75NTR comprises a variant amino acid at one or more of position 75, 109, 133 and/or 134; A fusion protein comprising such companion animal p75NTR extracellular domain with a variant amino acid and a half-life extending moiety; An isolated nucleic acid encoding said isolated polypeptide or fusion protein; A vector comprising said nucleic acid; A host cell comprising such nucleic acid or vector; A pharmaceutical composition comprising such isolated polypeptide or fusion protein; Medical use and method for treating an NGF-related disorder in a companion animal comprising administering an effective amount of said products, especially for treating osteoarthritis; A method of inhibiting NGF activity and/or pro-NGF activity in a companion animal comprising administering said polypeptide or fusion protein.

1.1. claims: 1-34 (partially)

As invention 1, wherein said p75NTR comprises at least a variant amino acid at position 75.

1.2. claims: 1-34 (partially)

As invention 1, wherein said p75NTR comprises at least a variant amino acid at position 109.

1.3. claims: 1-34 (partially)

As invention 1, wherein said p75NTR comprises at least a variant amino acid at position 133.

1.4. claims: 1-34 (partially)

As invention 1, wherein said p75NTR comprises at least a variant amino acid at position 134.
