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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, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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- Published:**
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- (88) **Date of publication of the international search report:**
24 April 2014



WO 2012/145665 A3

(54) **Title:** METHOD OF DRUG DELIVERY FOR PTH, PTHRP AND RELATED PEPTIDES

(57) **Abstract:** The present invention provides compositions, devices, methods and processes related to the intradermal delivery of PTHrP and PTHrP analogues, particularly [Glu^{22,25}, Leu^{23,28,31}, Aib₂₉, Lys^{26,30}]hPTHrP(1-34)NH₂.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 12/34510

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61K 38/29; A61P 19/10 (2012.01)

USPC - 514/21.3, 514/16.9

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)

IPC(8) - A61K 38/29; A61P 19/10 (2012.01)

USPC - 514/21.3, 514/16.9

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC(8) - A61K 38/29; A61P 19/10 (2012.01), USPC - 514/21.3, 514/16.9, 515/1.1, 515/16.7: keyword search, as below

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

USPTO PubWest (databases: PGPB,USPT,USOC,EPAB,JPAB), Thompson Innovation (core patent databases), Google Scholar --
Search Terms: PTHrP, hPTHrP, (1-34), parathyroid hormone related protein, peptide, aminoisobutyric, Aib, microprojections,
microneedle, microarray, transdermal, viscosity

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2009/137093 A1 (DEY et al.) 12 November 2009 (12.11.2009) abstract; pg. 2, ln 3-7; pg 7, ln 16-17; pg. 27, ln 21-22; pg. 7, ln 17; pg 7, ln 11-12; pg. 7, ln 20-29	1-5, 9, 29
Y	US 2009/0117158 A1 (AMERI et al.) 7 May 2009 (07.05.2009) abstract; para [0001]; claim 13; para [0060]; [0149]; [0071]; [0014]	1-5, 9, 29
Y	WO 2008/063279 A2 (DEY et al.) 29 May 2008 (29.05.2008) entire document	1-5, 9, 29
Y	US 6,921,750 B2 (Dong) 26 July 2005 (26.07.2005) entire document	1-5, 9, 29
Y	DADONNA et al. "Parathyroid Hormone (1-34)-Coated Microneedle Patch System: Clinical Pharmacokinetics and Pharmacodynamics for Treatment of Osteoporosis" Pharm. Res.; published online 22 June 2010; Vol. 28; pg. 159-165. entire document, especially abstract	1-5, 9, 29

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search 11 August 2012 (11.08.2012)	Date of mailing of the international search report 31 AUG 2012
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/34510

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.: 6-8, 10-28 and 30-144
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.