

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
24 December 2003 (24.12.2003)

PCT

(10) International Publication Number  
**WO 2003/105772 A3**

(51) International Patent Classification<sup>7</sup>: **A61K 38/00**,  
38/29

(21) International Application Number:  
PCT/US2003/018890

(22) International Filing Date: 13 June 2003 (13.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/388,918 13 June 2002 (13.06.2002) US  
60/398,005 23 July 2002 (23.07.2002) US

(81) Designated States (*national*): AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): **BETH ISRAEL DEACONESS MEDICAL CENTER, INC.** [US/US]; 330 Brookline Avenue, Boston, MA 02215 (US).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **CHOREV, Michael** [US/US]; 205 South Street, Chestnut Hill, MA 02167 (US). **ROSENBLATT, Michael** [US/US]; 130 Lake Avenue, Newton Centre, MA 02159 (US).

(74) Agent: **VAN AMSTERDAM, John, R.**; Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210 (US).

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:  
8 April 2004

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: ANALOGS OF PARATHYROID HORMONE AND PTH-RELATED PROTEIN AS BONE ANABOLIC AGENTS

(57) Abstract: The invention provides novel parathyroid hormone analogs and parathyroid hormones-related protein analogs. The invention also provides methods of using these analogs to treat osteoporosis, promote the formation of bone, and inhibit bone loss.



WO 2003/105772 A3

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/18890

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : A61K 38/00, 38/29  
 US CL : 530/324

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)  
 U.S. : 530/324; 514/2, 12

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)  
 Please See Continuation Sheet

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 6,537,965 B1 (BRINGHURST et al.) 25 March 2003 (25.03.2003), see entire document.	1-3, 8, 28-30, 35, 55-59, 61
A	US 5,747,456 A (CHOREV et al.) 05 May 1998 (05.05.1998), see entire document.	1-3, 8, 28-30, 35, 55-59, 61
A	US 6,316,410 B1 (BARBIER et al.) 13 November 2001 (13.11.2001), see entire document.	1-3, 8, 28-30, 35, 55-59, 61

Further documents are listed in the continuation of Box C.

See patent family annex.

* 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 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 December 2003 (11.12.2003)

Date of mailing of the international search report

20 FEB 2004

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. (703)305-3230

Authorized officer

B. Dell Chism

Telephone No. (703) 308-0196

# INTERNATIONAL SEARCH REPORT

PCT/US03/18890

**Continuation of B. FIELDS SEARCHED Item 3:**

STN; WEST; BIOSIS, SCISEARCH, MEDLINE, CAPLUS, REGISTRY  
search terms: bone, osteoporosis, reformation, osteoclast, parathyroid, pth

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/18890

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claim Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claim 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.  Claim Nos.: 4-7, 9-27, 31-34, 36-54, 60, 62-77  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 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 an additional fee, this Authority did not invite payment of any additional fee.
  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.  
 No protest accompanied the payment of additional search fees.