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(54) Title: M-CSF SPECIFIC MONOCLONAL ANTIBODY AND USES THEREOF

(57) Abstract: M-CSF-specific RXI -based or RX-I derived antibodies are provided, along with pharmaceutical compositions containing such antibody, kits containing a pharmaceutical composition, and methods of preventing and treating bone loss in or remodeling in a subject afflicted with an osteoblastic or osteolytic disease.

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. C07K16/24 A61K39/395 A61P19/08

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 practical, search terms used)
EPO-Internal, WPI Data, BIOSIS

| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|---|---|-----------------------|
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| Y | WO 2004/045532 A2 (CHIRON CORP [US]) 3 June 2004 (2004-06-03) the whole document | 1-26 |
| Y | US 2005/059113 A1 (BEDIAN VAHE [US] ET AL) 17 March 2005 (2005-03-17) page 1, paragraph 6 - page 28, paragraph 290 | 1-26 |
| Y | US 5 766 886 A (STUDNICKA GARY M [US] ET AL) 16 June 1998 (1998-06-16) cited in the application the whole document | 8-23 |
| | ----- -/-- | |

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|---|---|

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/029279

| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|---|-----------------------|
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| Y | STUDNICKA G M ET AL: "Human-engineered monoclonal antibodies retain full specific binding activity by preserving non-CDR complementarity-modulating residues" PROTEIN ENGINEERING, OXFORD UNIVERSITY PRESS, SURREY, GB, vol. 7, no. 6, 1 June 1994 (1994-06-01), pages 805-814, XP000447301 ISSN: 0269-2139 cited in the application the whole document | 8-23 |
| Y | ----- Mouse anti-Human M-CSF Monoclonal Antibody [116] Datasheet, Catalogue No. MO-C40048A, Clone No. 116, Anogen. XP002414614 the whole document | 1-26 |
| Y | ----- Mouse anti-Human M-CSF Monoclonal Antibody [692] Datasheet, Catalogue No. MO-C40048B, Clone No. 692, Anogen. XP002414615 the whole document | 1-26 |
| Y | ----- Mouse anti-Human M-CSF Monoclonal Antibody [21] Datasheet, Catalogue No. MO-C40048D, Clone No. 21, Anogen. XP002414616 the whole document | 1-26 |
| Y | ----- Monoclonal Anti-human M-CSF Antibody, Cat. No. MAB216, Clone 26730, R&D Systems XP002414617 the whole document | 1-26 |
| A | ----- YOSHIDA H ET AL: "The murine mutation osteopetrosis is in the coding region of the macrophage colony stimulating factor gene." NATURE. 31 MAY 1990, vol. 345, no. 6274, 31 May 1990 (1990-05-31), pages 442-444, XP002414608 ISSN: 0028-0836 cited in the application the whole document | |
| | ----- -/-- | |

INTERNATIONAL SEARCH REPORT

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PCT/US2006/029279

| G(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|--|-----------------------|
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A | <p>WIKTOR-JEDRZEJCZAK W ET AL: "Total absence of colony-stimulating factor 1 in the macrophage-deficient osteopetrotic (op/op) mouse." PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA. JUN 1990, vol. 87, no. 12, June 1990 (1990-06), pages 4828-4832, XP002414609 ISSN: 0027-8424 cited in the application the whole document</p> <p style="text-align: center;">-----</p> | |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2006/029279

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|-----------------------------|
| WO 2004045532 | A2 | 03-06-2004 | AU 2003291002 A1 15-06-2004 |
| | | | CA 2505994 A1 03-06-2004 |
| | | | CN 1787837 A 14-06-2006 |
| | | | EP 1572106 A2 14-09-2005 |
| | | | JP 2006519163 T 24-08-2006 |
| US 2005059113 | A1 | 17-03-2005 | US 2006153850 A1 13-07-2006 |
| US 5766886 | A | 16-06-1998 | AT 249840 T 15-10-2003 |
| | | | CA 2103887 A1 14-06-1993 |
| | | | DE 69233204 D1 23-10-2003 |
| | | | DE 69233204 T2 15-07-2004 |
| | | | EP 0571613 A1 01-12-1993 |
| | | | ES 2202310 T3 01-04-2004 |
| | | | JP 6506362 T 21-07-1994 |
| | | | JP 2005160485 A 23-06-2005 |
| | | | WO 9311794 A1 24-06-1993 |