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15 May 2008

(54) Title: CHELATING CONJUGATES HAVING A SUBSTITUTED AROMATIC MOIETY AND DERIVATIVES THEREOF

(57) Abstract: The present invention is directed to metal chelating conjugates for use as metallopharmaceutical diagnostic or therapeutic agents. Specifically, conjugates of the present invention include one or more carriers, a linker, and a metal coordinating moiety comprising a substituted phenyl, pyridyl, or pyrimidyl derivative.



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INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

INV. A61K49/00 A61K51/04 A61K51/08 A61K47/48

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)

A61K

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, CHEM ABS Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 2007/100563 A (MALLINCKRODT INC [US]; MOORE DENNIS A [US]) 7 September 2007 (2007-09-07) claims 1-35	1-4, 6-33
X	US 5 639 737 A (RUBIN DAVID [US]) 17 June 1997 (1997-06-17) column 7, paragraph 3 claims 1-4	1-3, 21, 22, 25-27
X	US 6 602 989 B1 (SADIK OMOWUNMI A [US] ET AL) 5 August 2003 (2003-08-05) claims 1-5 column 2, paragraph 4 ----- -/-	1, 2, 7, 8, 21, 22, 25, 26

☒ 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 document 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.

Z document member of the same patent family

Date of the actual completion of the international search

25 January 2008

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2007/006512

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 93/08688 A (RUBIN DAVID [US]; SCHWIMMER ADOLPH [US]) 13 May 1993 (1993-05-13) claims 1,16 page 7, paragraph 4 -----	1-3,15, 25,27
X	WO 2005/023310 A (UNIV FLORIDA [US]; BERGERON RAYMOND J JR [US]) 17 March 2005 (2005-03-17) claims 1,2,46,70-72 -----	1-3,7,8, 15-22, 25-27
A	US 6 143 274 A (TWEEDLE MICHAEL F [US] ET AL) 7 November 2000 (2000-11-07) column 5, line 45 - line 63 column 6, line 57 - column 7, line 20 claims 9,10 -----	
A	JONES-WILSON T M ET AL: "NEW HYDROXYBENZYL AND HYDROXYPYRIDYLMETHYL SUBSTITUTED TRIAZACYCLONONANE LIGANDS FOR USE WITH GALLIUM(III) AND INDIUM(III)" NUCLEAR MEDICINE AND BIOLOGY, ELSEVIER, NY, US, vol. 22, no. 7, 1995, pages 859-868, XP001004873 ISSN: 0969-8051 figure 1 -----	1
E	WO 2007/064661 A (MALLINCKRODT INC [US]; MOORE DENNIS A [US]; HOWARD CAROL P [US]) 7 June 2007 (2007-06-07) claims 1,15,21,26 -----	1-4,6-33
A	MATHIAS: "N,N' bis 2-hydroxybenzyl..." BIOCONJUGATE CHEMISTRY, vol. 1, no. 3, 1990, pages 204-211, XP008087842 figure 1 abstract -----	
A	WOODS: "synthesis and luminescence studies of aryl ..." INORGANIC CHEMISTRY, vol. 42, no. 14, 2003, page 44014408, XP008087844 figure 1 -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/006512

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:

Although claims 26,27 are directed to a method of treatment/diagnostic method of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
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 allsearchable 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.:

1-4, 6-33 (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: 1-4,6-33 (partially)

A conjugate comprising a bio-directing carrier, a metal coordinating moiety, and a linker chemically linking the metal coordinating moiety to the carrier, the metal coordinating moiety comprising at least one optionally substituted 1,3-dihydroxyphenyl, 1,3-dithiolphenyl, 1-hydroxy-3-thiolphenyl, 1-thiol-3-hydroxyphenyl moiety, or a combination thereof.

2. claims: 1-4,6-33 (partially)

A conjugate comprising a bio-directing carrier, a metal coordinating moiety, and a linker chemically linking the metal coordinating moiety to the carrier, the metal coordinating moiety comprising at least one optionally substituted 3,5-dihydroxypyridyl, 2,4-dihydroxypyridyl, 3,5-dithiolpyridyl, 2,4-dithiolpyridyl, 3-hydroxy-5-thiolpyridyl, 2-hydroxy-4-thiolpyridyl, 3-thiol-5-hydroxypyridyl, 2-thiol-4-hydroxypyridyl moiety, or a combination thereof.

3. claims: 1-4,6-33 (partially)

A conjugate comprising a bio-directing carrier, a metal coordinating moiety, and a linker chemically linking the metal coordinating moiety to the carrier, the metal coordinating moiety comprising at least one optionally substituted 4,6-dihydroxypyrimidyl, 4,6-dithiolpyrimidyl, 4-hydroxy-6-thiolpyrimidyl, 4-thiol-6-hydroxypyrimidyl moiety, or a combination thereof.

4. claims: 7,8,25-27 (partially); 5

A conjugate comprising a bio-directing carrier, a metal coordinating moiety, and a linker chemically linking the metal coordinating moiety to the carrier, the metal coordinating moiety being selected from EDTA, DTPA, DCTA, DOTA, TETA or analogs or a combination thereof.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/006512

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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