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			(88) Date of publication of the international search report: 13 June 1996 (13.06.96)
(54) Title: LIPID ANALOGS FOR TREATING VIRAL INFECTIONS			
(57) Abstract A method of treating viral infections, and in particular HIV-1, hepatitis B virus, and herpesviruses, is disclosed. The method comprising administering to a subject in need of such treatment an infection-combating amount of a phospholipid or phospholipid derivative.			

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INTERNATIONAL SEARCH REPORT

Internat I Application No
PCT/US 95/10111

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61K31/685 A61K31/675 C07F9/10 C07H19/10 C07H19/20

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 6 A61K C07F C07H

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,Y	DE,A,39 34 820 (BOEHRINGER MANNHEIM) 25 April 1991 see page 2, line 50 - page 3, line 5 see page 5, last paragraph ---	1-52, 85-91, 103
Y	J.MED.CHEM., vol.34, no.4, 19 October 0 pages 1377 - 83 'In vitro evaluation of phosphocholine and quaternary ammonium containing lipids as novel anti-HIV agents' see page 1377, left column, line 26 - line 38 --- -/--	103

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in 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.

& document member of the same patent family

Date of the actual completion of the international search

7 March 1996

Date of mailing of the international search report

29.04.96

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

Internat'l Application No
PCT/US 95/10111

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y,P	AIDS RES. HUM. RETROVIRUSES, vol.11, no.6, 5 pages 705 - 712 'Membrane interactive phospholipids inhibit HIV type 1-induced cell fusion and surface gp160/gp 120 binding to monoclonal antibody' see page 705	1-52
Y	DE,A,40 10 228 (MÜLLER) 2 October 1991 see claim 1	1-20, 35-40, 85-91
A	WO,A,91 09602 (BOEHRINGER MANNHEIM) 11 July 1991 see the whole document	1-20, 35-40, 45-72, 85-91, 103

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 95/ 10111

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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:
Please see remark on the enclosed sheets!
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 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. claims 1-20, 35-40-, 47-52, 85-91, 103
2. claims 21-34, 41-46, 53-58, 92-98, 104
3. claims 59-84, 99-102, 105, 106

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.:

1. claims 1-20, 35-40, 47-52, 85-91, 103

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/210

REASONED STATEMENT

Compounds of four different structural formulas I to IV and their different medical uses are claimed.

The ISA has checked whether there is a priori a technical relationship among the four formulas in the form of a single characteristic subunit appearing in all formulas I to IV.

The only common subunit is the substituted phosphoric group.

The common inventive concept underlying claims 1-106 is therefore the provision of new antiviral compounds characterised by a substituted phosphoric group.

This concept is not novel in view of all documents cited in the partial search report. All these documents disclose compounds having a substituted phosphoric group, their pharmacological activities, and their use in medicine, in particular in the treatment of viral diseases and cancer (cf. passages cited in the search report). These documents not only anticipate the subunit common to all formulas I to IV, but also the substructure of phosphatidylcholine, common to formulas I and II.

In this situation the structures (I), (II), and (III + IV) are regarded, a posteriori, as belonging to three different inventive concepts.

In absence of an alternative technical feature common to all claims 1-106 in the sense of Rule 30 EPC, i.e. having the meaning of a common special technical feature defining a contribution over the prior art, the compounds of the different structural formulas (I), (II), and (III + IV) (together with their relevant medical uses) represent three different inventions, as listed in the communication pursuant to Article 17(3)a PCT.

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FURTHER INFORMATION CONTINUED FROM PCT/ISA/210

The present search has been limited to the first listed invention. Covering all the other subjects in a single search would have caused major additional searching efforts.

Should a search fee be paid for the third invention, it cannot be ruled out that, in presence of prior art anticipating a characteristic substructure common to the two formulas III and IV, a further unity objection will be raised, dividing the claimed subject matter relating to formula III from that relating to formula IV.

YES : claims 1-20, 35-40, 47-52, 85-91, 103

Compounds of formula I per se; their use in the manufacture of medicaments for combating viral infection, for inhibiting the production of hepatitis B virus antigen, for inhibiting the incorporation of HIV-1 major glycoprotein gp120 into a cell membrane of a subject infected with HIV-1, and for combating tumors.

NO : claims 21-34, 41-46, 53-58, 92-98, 104

Compounds of formula II per se; their use in the manufacture of medicaments for combating viral infection, for inhibiting the production of hepatitis B virus antigen, for inhibiting the incorporation of HIV-1 major glycoprotein gp120 into a cell membrane of a subject infected with HIV-1, and for combating tumors.

NO : claims 59-84, 99-102, 105, 106

Compounds of formulas III and IV per se; their use in the

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US95/ 10111

FURTHER INFORMATION CONTINUED FROM PCT/ISA/210

manufacture of medicaments for combating viral infections and for combating tumours.

Remark:

Although claims 1-84, 103-106 are directed to a method of treatment of (diagnostic method practised on) the human/animal body the search has been carried on and based on the alleged effects of the compound/composition.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 95/10111

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-A-3934820	25-04-91	AU-B- 6529190 WO-A- 9105558	16-05-91 02-05-91
DE-A-4010228	02-10-91	NONE	
WO-A-9109602	11-07-91	DE-A- 3942933 AU-B- 8004291 DE-D- 59005139 EP-A- 0506704	27-06-91 24-07-91 28-04-94 07-10-92