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(54) Title: ORGANIC THIOPHOSPHATE ANTIRETROVIRAL AGENTS

(57) Abstract: A method for the prevention or treatment of human immunodeficiency virus infection by administering an effective amount of amifostine, phosphonol, or similar compound to an individual in need is provided.



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# INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

INV. A61K31/095 A61K31/105 A61K31/506 A61K31/52 A61K31/66  
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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 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, EMBASE, BIOSIS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 804 571 A (SCHEIN PHILIP S [US]) 8 September 1998 (1998-09-08)  column 1, line 64 - column 2, line 6 column 3, lines 10-26 examples 5-9 claim 1	1-12, 22-31, 37-40
X	WO 94/22307 A (SCHEIN PHILIP A [US]; KALEBIC THEA [US]) 13 October 1994 (1994-10-13)  page 6, line 9 - page 9, line 19 page 12, line 32 - page 13, line 10 claims 1-35  ----- -/--	1-12, 19-21, 23-31, 37-40

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

☒ See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/132795 A1 (STOGNIEW MARTIN [US] ET AL) 19 September 2002 (2002-09-19) page 3, paragraph 20 page 5, paragraph 32-42 page 7, paragraph 69 claims 1-4,13,16	1-12
X	US 6 489 312 B1 (STOGNIEW MARTIN [US] ET AL) 3 December 2002 (2002-12-03) column 2, lines 53-63 column 5, line 30 - column 7, line 66 column 10, lines 35-38	1-12,15
X	SANTINI V ET AL: "THE POTENTIAL OF AMIFOSTINE: FROM CYTOPROTECTANT TO THERAPEUTIC AGENT" HAEMATOLOGICA, FONDAZIONE FERRATA STORTI, ROME, IT, vol. 84, 1 January 1999 (1999-01-01), pages 1035-1042, XP000938345 ISSN: 0390-6078 page 1036, column 2, paragraphs 3,4 page 1036, column 1, paragraph 4	1-9
X	GÜL ÖZCAN ARICAN: "Cytoprotective effects of amifostine and cysteamine on cultured normal and tumor cells treated with paclitaxel in terms of mitotic index and 3H-thymidine labeling index" CANCER CHEMOTHERAPY AND PHARMACOLOGY, SPRINGER-VERLAG, BE, vol. 56, no. 2, 1 August 2005 (2005-08-01), pages 221-229, XP019334184 ISSN: 1432-0843 the whole document	1-9
X	CAPIZZI ET AL: "The preclinical basis for broad-spectrum selective cytoprotection of normal tissues from cytotoxic therapies by amifostine (Ethyol(R))" EUROPEAN JOURNAL OF CANCER, PERGAMON PRESS, OXFORD, GB, vol. 32, 1 January 1996 (1996-01-01), pages S5-S16, XP005055733 ISSN: 0959-8049 the whole document	1-9

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/009234

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5804571	A	08-09-1998	NONE	
WO 9422307	A	13-10-1994	AU 6492394 A US 5824664 A	24-10-1994 20-10-1998
US 2002132795	A1	19-09-2002	NONE	
US 6489312	B1	03-12-2002	US 2003096797 A1	22-05-2003