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

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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: 2-AMINO-QUINAZOLIN-5-ONES AS HSP90 INHIBITORS USEFUL IN TREATING PROLIFERATION DISEASES

(57) Abstract: 2-Amino-quinazolin-5-one compounds, stereoisomers, tautomers, pharmaceutically acceptable salts, and prodrugs thereof; compositions that include a pharmaceutically acceptable carrier and one or more of the 2-amino-quinazolin-5-one compounds, either alone or in combination with at least one additional therapeutic agent. Methods of using the 2-amino-quinazolin-5-one compounds, either alone or in combination with at least one additional therapeutic agent, in the prophylaxis or treatment of cell proliferative diseases.

WO 2006/113498 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/014194

A. CLASSIFICATION OF SUBJECT MATTER					
INV.	C07D239/84	C07D401/10	C07D403/12	C07D403/10	C07D401/12
	C07D403/04	C07D417/12	C07D401/14	C07D417/10	C07D401/04
	C07D413/10	A61K31/517	A61P35/00		

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)
C07D

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2004/113335 A2 (CHIRON CORP [US]; WANG WEIBO [US]; CONSTANTINE RYAN N [US]; LAGNITON L) 29 December 2004 (2004-12-29) claims 1-34	1-38
A	WO 2004/099159 A (INST FOR PHARMACEUTICAL DISCOV [US]; SAVOY JENNIFER [US]; GERACI LEO []) 18 November 2004 (2004-11-18) claims 1-53	1-38

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	"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
"E" earlier document but published on or after the international filing date	"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
"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)	"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.
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"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 26 October 2006	Date of mailing of the international search report 07/11/2006
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Name and mailing address of the ISA/ European Patent Office, P.B. 5819 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Kyriakakou, Georgia
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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/014194

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>DYMOCK B W ET AL: "INHIBITORS OF HSP90 AND OTHER CHAPERONES FOR THE TREATMENT OF CANCER" EXPERT OPINION ON THERAPEUTIC PATENTS, ASHLEY PUBLICATIONS, GB, vol. 14, no. 6, 2004, pages 837-847, XP001204795 ISSN: 1354-3776 the whole document</p>	1-38
A	<p>NECKERS L: "DEVELOPMENT OF SMALL MOLECULE HSP90 INHIBITORS: UTILIZING BOTH FORWARD AND REVERSE CHEMICAL GENOMICS FOR DRUG IDENTIFICATION" CURRENT MEDICINAL CHEMISTRY, BENTHAM SCIENCE PUBLISHERS BV, BE, vol. 10, no. 9, May 2003 (2003-05), pages 733-739, XP009064039 ISSN: 0929-8673 the whole document</p>	1-38
A	<p>SREEDHAR A S ET AL: "Inhibition of Hsp90: a new strategy for inhibiting protein kinases" BIOCHIMICA ET BIOPHYSICA ACTA (BBA) - PROTEINS & PROTEOMICS, ELSEVIER, vol. 1697, no. 1-2, 11 March 2004 (2004-03-11), pages 233-242, XP004496051 ISSN: 1570-9639 the whole document</p>	1-38

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/014194

Box 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 34 and 35 are directed to a method of treatment 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 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:

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2006/014194

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2004113335 A2	29-12-2004	AU 2004249730 A1	29-12-2004
		CA 2528771 A1	29-12-2004
		CN 1809563 A	26-07-2006
		EP 1636225 A2	22-03-2006
		MX PA05013142 A	17-03-2006
WO 2004099159 A	18-11-2004	AU 2004236239 A1	18-11-2004
		CA 2524221 A1	18-11-2004
		EP 1618094 A1	25-01-2006
		MX PA05011523 A	23-01-2006