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(88) **Date of publication of the revised international search report:**

28 March 2013

(15) **Information about Correction:**

see Notice of 28 March 2013

(54) **Title:** HETEROCYCLIC COMPOUNDS AND USES THEREOF

(57) **Abstract:** Compounds and pharmaceutical compositions that modulate kinase activity, including PI3 kinase activity, and compounds, pharmaceutical compositions, and methods of treatment of diseases and conditions associated with kinase activity, including PI3 kinase activity, are described herein.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER INV. C07D471/04 C07D487/04 A61K31/4725 A61P37/00 ADD.		
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 practicable, search terms used) EPO-Internal, WPI Data, 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.
Y	US 2009/312319 A1 (REN PINGDA [US] ET AL) 17 December 2009 (2009-12-17) pages 19-31	1-39, 45-82, 140-142
Y	----- WO 2009/088986 A1 (INTELLIKINE INC [US]; REN PINGDA [US]; LIU YI [US]; WILSON TROY EDWARD) 16 July 2009 (2009-07-16) pages 23-33	1-39, 45-82, 140-142
Y	----- US 2002/161014 A1 (SADHU CHANCHAL [US] ET AL) 31 October 2002 (2002-10-31) paragraph [0212] - paragraph [0254] ----- -/--	1-39, 45-82, 140-142
☒ 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 application or patent 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 20 September 2012	Date of mailing of the international search report 10/12/2012	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Lauro Paola	

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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.
Y	WO 2009/064802 A2 (LILLY CO ELI [US]; WHITE STEPHEN L [US]; RUAN FUQIANG [US]; KESICKI ED) 22 May 2009 (2009-05-22) pages 15-22 -----	1-39, 45-82, 140-142
X,P	WO 2011/146882 A1 (INTELLIKINE INC [US]; INFINITY PHARMACEUTICALS INC [US]; REN PINGDA [U] 24 November 2011 (2011-11-24) example 31; compounds 65-79 -----	45-82
Y,P		1-39
Y,P	Peter Norman: "Selective PI3K[delta] inhibitors, a review of the patent literature Read More: http://informahealthcare.com/doi/abs/10.1517/13543776.2011.629606 , Expert Opinion on Therapeutic Patents, 30 November 2011 (2011-11-30), pages 1773-1790, XP055019802, DOI: 10.1517/13543776.2011.629606 Retrieved from the Internet: URL: http://informahealthcare.com/doi/abs/10.1517/13543776.2011.629606 [retrieved on 2012-02-20] the whole document -----	1-39, 45-82, 140-142

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/047186

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:
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 all searchable 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.:

2-7, 46-51(completely); 1, 20-39, 45, 64-82, 140-142(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: 2-7, 46-51(completely); 1, 20-39, 45, 64-82, 140-142(partially)

Isoquinolone or quinazolone derivatives, i.e. compounds of formula (I) and Formula (XII) wherein Cy represents a fused aryl ring and their pharmaceutical compositions

2. claims: 8-19, 52-63(completely); 1, 20-39, 45, 64-82, 140-142(partially)

Compounds of Formula (I) and Formula (XII) wherein Cy represents a fused heteroaryl ring and their pharmaceutical compositions

3. claims: 42, 103(completely); 40, 41, 43, 44, 101, 102, 104-107, 140-142(partially)

Compounds of Formula (XI) and formula (XXII) wherein Cy represents a fused aryl ring and their pharmaceutical compositions

4. claims: 40, 41, 43, 44, 101, 102, 104-107, 140-142(all partially)

Compounds of Formula (XI) and formula (XXII) wherein Cy represents a fused heteroaryl ring and their pharmaceutical compositions

5. claims: 83-100(completely); 140-142(partially)

Compounds of Formula (XXIII) and their pharmaceutical compositions

6. claims: 109, 112-114(completely); 108, 121-135, 140-142(partially)

Compounds of Formula (XXV) wherein Wb1=Wb2=CR3 and their pharmaceutical compositions

7. claims: 110, 111, 115-120(completely); 108, 121-135, 140-142(partially)

Compounds of Formula (XXV) wherein Wb1 and Wb2 do not both represent CR3 and their pharmaceutical compositions

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

8. claims: 136-142(partially)

Compounds of Formula (XXXIV) and their pharmaceutical
compositions

9. claims: 136-142(partially)

Compounds of Formula (XXXIV) and their pharmaceutical
compositions

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/047186

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