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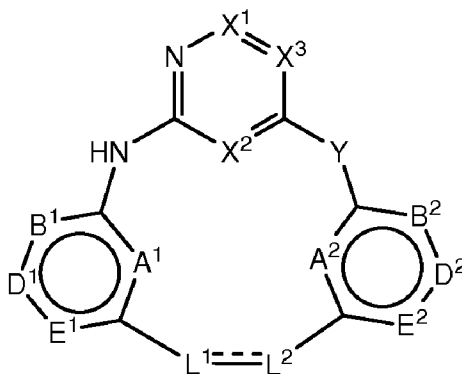
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(54) Title: MACROCYCLIC COMPOUNDS AND THEIR USE AS KINASE INHIBITORS



I

(57) Abstract: The present invention relates to macrocyclic compounds of Formula I: or pharmaceutically acceptable salts thereof or quaternary ammonium salts thereof wherein constituent members are provided hereinwith, as well as their compositions and methods of use, which are JAK/ ALK inhibitors useful in the treatment of JAK/ALK-associated diseases including, for example, inflammatory and autoimmune disorders, as well as cancer.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2009/041555

A. CLASSIFICATION OF SUBJECT MATTER

INV. C07D239/48 C07D403/12 C07D403/14 C07D407/12 C07D409/12
C07D413/12 C07D413/14 C07D417/14 C07D498/04 A61K31/505
A61K31/506 A61K31/433 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, BEILSTEIN 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.
X	WO 2006/061415 A (JANSSEN PHARMACEUTICA NV [BE]; FREYNE EDDY JEAN EDGARD [BE]; WILLEMS M) 15 June 2006 (2006-06-15) compounds 1,2,19-29,128,217-258 -----	1-80
X	US 2004/209895 A1 (LUECKING ULRICH [DE] ET AL) 21 October 2004 (2004-10-21) claims 12-23; compounds 14.13, 15.46-15.48 -----	1-80

☐ 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.

"&" document member of the same patent family

Date of the actual completion of the international search

1 September 2010

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21/09/2010

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/041555

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.:
1-80
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 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: 1-11, 13, 15, 16, 19-53, 73-80(all partially)

A compound of formula (I) wherein X1-X3 mean N and its use

2. claims: 1-11, 13-16, 19-53, 73-80(all partially)

A compound of formula (I) wherein X1, X2 mean N and X3 means C and its use

3. claims: 1-11, 14-16, 19-53, 73-80(all partially)

A compound of formula (I) wherein X1, X3 mean N and X2 means C and its use

4. claims: 1-11, 14-16, 19-53, 73-80(all partially)

A compound of formula (I) wherein X1 means N and X2, X3 mean C and its use

5. claims: 1-13, 15, 16, 19-53, 73-80(all partially)

A compound of formula (I) wherein X1 means C and X2, X3 mean N and its use

6. claims: 1-80(partially)

A compound of formula (I) wherein X1, X3 mean C and X2 means N and its use

7. claims: 1-12, 15, 16, 19-53, 73-80(all partially)

A compound of formula (I) wherein X1, X2 mean C and X3 means N and its use

8. claims: 1-21, 26-80(all partially)

A compound of formula (I) wherein X1-X3 mean C and its use

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2009/041555

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