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Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

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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: IMMUNOSUPPRESSIVE EFFECTS OF PTERIDINE DERIVATIVES

(57) Abstract: Novel poly-substituted pteridinediones (lumazines), and mono- or polysubstituted 2-thiolumazines, 4-thiolumazines or 2,4-dithiolumazines, having disclosed substituents in positions 1, 3, 6 and 7 of the pteridine ring, and pharmaceutically acceptable salts thereof, are useful as biologically active ingredients in preparing pharmaceutical compositions especially for the treatment or prevention of a CNS disorder, a cell proliferative disorder, a viral infection, an immune or auto-immune disorder or a transplant rejection. Combinations of the pteridine derivatives of the invention with an immunosuppressant or immunomodulator drug, an antineoplastic drug or an antiviral agent, providing potential synergistic effects, are also disclosed.



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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07D475/00 C07D475/02 A61K31/519

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 7 C07D A61K

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	US 3 071 587 A (W. V. CURRAN, R. B. ANGIER) 1 January 1963 (1963-01-01) cited in the application claims 1-5	1-4
P, X	US 2003/236255 A1 (M. J. A. WAER ET AL.) 25 December 2003 (2003-12-25) claims 1-19	1-10
X	WO 94/06431 A (CELL THERAPEUTICS, INC.) 31 March 1994 (1994-03-31) cited in the application claims 1-10	1-10
X	WO 00/45800 A (K. U. LEUVEN RESEARCH & DEVELOPMENT) 10 August 2000 (2000-08-10) cited in the application claims 1-15	1-10
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☒ 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
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- *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
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- * & * document member of the same patent family

Date of the actual completion of the international search

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 International Application No
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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	EP 0 290 819 A (BIORESEARCH SPA) 17 November 1988 (1988-11-17) claims 1-14 -----	1-10
X	WO 94/11001 A (CELL THERAPEUTICS, INC.) 26 May 1994 (1994-05-26) cited in the application claims 1-12 -----	1-10
X	US 5 843 943 A (D. A. CARSON ET AL.) 1 December 1998 (1998-12-01) claims 1-9 -----	1-10
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INTERNATIONAL SEARCH REPORT

 International Application No
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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	& A. V. GULEVSKAYA ET AL.: RUSS. CHEM. BL., vol. 52, no. 6, 2003, pages 1403-1410, ----- DATABASE BEILSTEIN BEILSTEIN INSTITUTE FOR ORGANIC CHEMISTRY, FRANKFURT-MAIN, DE; XP002296937 Database accession no. 7216143 abstract & T. SUGIMOTO, W. PFLEIDERER: HETEROCYCLES, vol. 41, no. 4, 1995, page 781-788, -----	1-5
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/005501

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	P. GIORI ET AL.: "Reactivity of 3H-Pyrimido[5,4-c][1,2,5]oxadiazin-3-one towards Carbanions: Synthesis of Pteridine-2,4-diones" J. HETEROCYCLIC CHEMISTRY, vol. 23, 1986, pages 1661-1665, XP009019187 table 1 -----	1-5

INTERNATIONAL SEARCH REPORT

International application No.
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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:
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:
see FURTHER INFORMATION sheet PCT/ISA/210
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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: -

Present claims 1 to 10 relate to an extremely large number of possible compounds. Support within the meaning of Article 84 EPC and/or disclosure within the meaning of Article 83 EPC is to be found, however, for only a very small proportion of the compounds claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

Furthermore, the initial phase of the search revealed a very large number of documents relevant to the issue of novelty. So many documents were retrieved that it is impossible to determine which parts of the claim(s) may be said to define subject-matter for which protection might legitimately be sought (Article 84 EPC). For these reasons, a meaningful search over the whole breadth of the claims is impossible. Consequently, the search has been restricted to the examples.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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