

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference see form PCT/ISA/220		FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/US2022/029102	International filing date (day/month/year) 13.05.2022	Priority date (day/month/year) 14.05.2021
International Patent Classification (IPC) or both national classification and IPC INV. C07D401/14 C07D403/12 A61P29/00 A61P37/00 A61K31/501		
Applicant BRISTOL-MYERS SQUIBB COMPANY		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	Date of completion of this opinion see form PCT/ISA/210	Authorized Officer Bakboord, Joan Telephone No. +49 89 2399-0	
--	--	---	---

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. ☐ forming part of the international application as filed:
 - ☐ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>2, 3, 6</u>
	No: Claims	<u>1, 4, 5, 7-11</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-11</u>
Industrial applicability (IA)	Yes: Claims	<u>1-11</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 The present application relates to pyridazine derivatives useful in the modulation of IL-12, IL-23 and/or IFN α by acting on Tyk-2. As such they can be used in the treatment of neurodegenerative diseases.

2 Claims 9-11 relate to subject-matter considered by this Authority to be covered by the provisions of Rule 39.1(iv) / 67.1(iv) PCT.

The patentability can be dependent upon the formulation of the claims. The EPO, for example, does not recognise as patentable claims to the use of a compound in medical treatment, but may allow claims to a product, in particular substances or compositions for use in a first or further medical treatment.

3 Reference is made to the following document:

D1 WO 2014/074661 A1

4 Novelty

Document D1 discloses a compound of formula I in which X is CH useful in the modulation of IL-12, IL-23 and/or IFN α by acting on Tyk-2.

A compound of formula I is disclosed in document D1. Claims 1, 4 and 5 therefore do not fulfil the requirements of Art 33(2) PCT.

A compound of formula I as described in claims 2, 3 and 6 is not disclosed in the cited prior art. Claims 2, 3 and 6 therefore fulfil the requirements of Art 33(2) PCT.

A pharmaceutical composition comprising a compound of formula I is disclosed in document D1. Claims 7 and 8 therefore do not fulfil the requirements of Art 33(2) PCT.

A method of treating a disease comprising administering to a patient a compound of formula I is disclosed in document D1. Claims 9-11 therefore do not fulfil the requirements of Art 33(2) PCT.

5 Inventive step

Starting from document D1 the problem to be solved in claims 2, 3 and 6 may be regarded to be the provision of further compounds useful in the modulation of IL-12, IL-23 and/or IFN α by acting on Tyk-2. The solution of the applicant resides in the compounds of formula I in which X is nitrogen. However, these

compounds are already generically disclosed in document D1. Further, replacing a carbon atom by a nitrogen atom is within the normal practise of a person skilled in the art seeking to provide further active compounds (bioisosterism). Since the present application does not contain evidence that the presently claimed compounds would have properties other than already known, inventive step cannot be acknowledged. The present application does not fulfil the requirements of Art 33(3) PCT.