

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/US2023/021803	International filing date (day/month/year) 11.05.2023	Priority date (day/month/year) 13.05.2022
International Patent Classification (IPC) or both national classification and IPC INV. C07D401/14 C07D413/14 C07D417/14 A61K31/4439 A61P31/14		
Applicant MERCK SHARP & DOHME LLC		

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 Bérillon, Laurent Telephone No. -0	
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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.
 - b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13ter.1(a)),
☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.
4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.
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>1-23</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-23</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-23</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

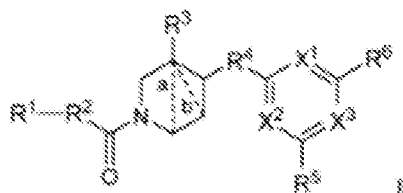
1 Prior art

Reference is made to D1: WO 2016/149271.

2 Claims 17 to 22 relate to subject-matter considered by this Authority to be covered by the provisions of Rule 39.1(iv) / Rule 67.1(iv) PCT. The patentability can be dependant upon the formulation of the claims. The EPO, for example does not recognise as patentable claims directed to the use of a compound in a medical treatment, but may allow claims to a product, in particular substances or compositions for use in a first or further medical treatment.

3 Novelty (Article 33(2) PCT)

The claimed compounds of formula I (see formula below) differ from those disclosed in D1 in view of their azabicyclohexane ring and 5-membered aromatic heterocyclyl ring R².



Novelty is therefore acknowledged for the claimed subject-matter.

4 Inventive step (Article 33(3) PCT)

The present application is directed to compounds of formula (I) and use thereof as agents for the treatment of respiratory syncytial virus infection and metapneumovirus infection.

The closest prior art is represented by D1 which equally relates to agents useful for the treatment of respiratory syncytial virus infection and metapneumovirus infection (see D1, [0370]).

As mentioned in item 3, the claimed compounds of formula I differ from those disclosed in D1.

The technical problem underlying the present invention is seen as the provision of further agents for the treatment of respiratory syncytial virus infection and metapneumovirus infection. The claimed compounds of formula I credibly solve said technical problem in view of the data provided in tables (I) and (II) on pages 138 and 139.

The claimed compounds are structurally quite remote from those disclosed in D1 in view of both their azabicyclohexane ring and 5-membered aromatic heterocyclyl ring R². Said distinguishing features are not suggested in the prior art. An inventive step is therefore acknowledged for the claimed subject-matter.