

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: see form PCT/ISA/220		PCT WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43 <i>bis</i> .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/US2022/042421	International filing date (day/month/year) 02.09.2022	Priority date (day/month/year) 07.09.2021	
International Patent Classification (IPC) or both national classification and IPC INV. C07H17/08 A61K31/7048 A61P11/00 A61P29/00 A61P37/02			
Applicant ZOETIS SERVICES 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 43*bis*.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 66.1*bis*(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 Klein, Didier 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 43*bis*.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 13*ter*.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 43*bis*.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>3-6, 9-11, 13, 14</u>
	No: Claims	<u>1, 2, 7, 8, 12, 15-17</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-17</u>
Industrial applicability (IA)	Yes: Claims	<u>1-17</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

- D1 WO 2017/085329 A1 (EPI-ENDO PHARMACEUTICALS EHF [IS]) 26 May 2017 (2017-05-26)
- D2 EP 0 508 699 A1 (MERCK & CO INC [US]) 14 October 1992 (1992-10-14)
- D3 El-Gindy Alaa ET AL: "DRUG FORMULATIONS AND CLINICAL METHODS Optimization and Validation of a Stability-Indicating RP-HPLC Method for Determination of Azithromycin and Its Related Compounds A", Journal of AOAC International (2011), 94(2), 513-522, 1 March 2011 (2011-03-01), pages 513-522, XP055980875, Retrieved from the Internet: URL:<https://academic.oup.com/jaoac/article-pdf/94/2/513/32422357/jaoac0513.pdf> [retrieved on 2022-11-14]
- D4 WO 2017/194452 A1 (FIDELTA D O O [HR]) 16 November 2017 (2017-11-16)
- D5 WO 2005/075494 A1 (ZAMBON SPA [IT]; MEREU ANDREA [IT] ET AL.) 18 August 2005 (2005-08-18)
- D6 WO 01/81358 A1 (PFIZER PROD INC [US]; BOETTNER WAYNE ALAN [US] ET AL.) 1 November 2001 (2001-11-01)
- D7 WO 2009/023196 A1 (Y S THERAPEUTICS CO LTD [JP]; MORIMOTO CHIKAO [JP] ET AL.) 19 February 2009 (2009-02-19)

Re Item V

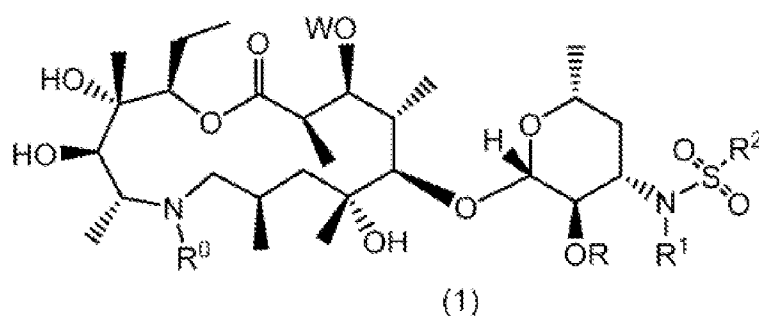
Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 1 Claim 16 relates to subject-matter considered by this Authority to be covered by the provisions of Rule 39.1(iv) / 67.1(iv) PCT.

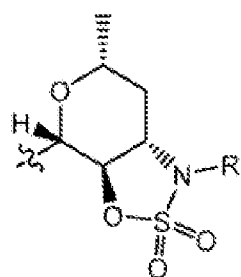
The patentability can be dependent upon the formulation of the claims. The EPO, for example, does not recognise as patentable claims to the use of a compound in medical treatment, but may allow claims to a product, in particular substances or compositions for use in a first or further medical treatment.

2 Novelty (Art. 33(2) PCT) :

2.1 The subject-matter of the present application concerns compound of the following formulae :

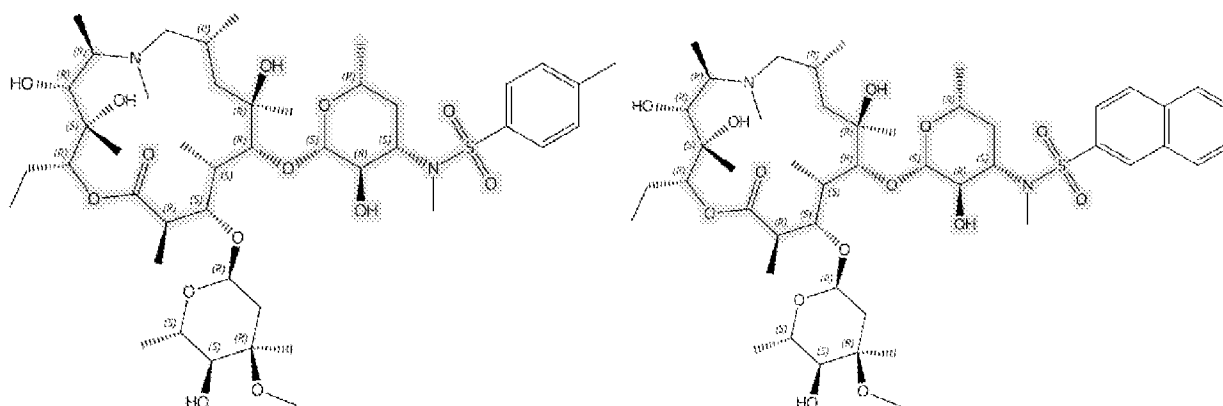


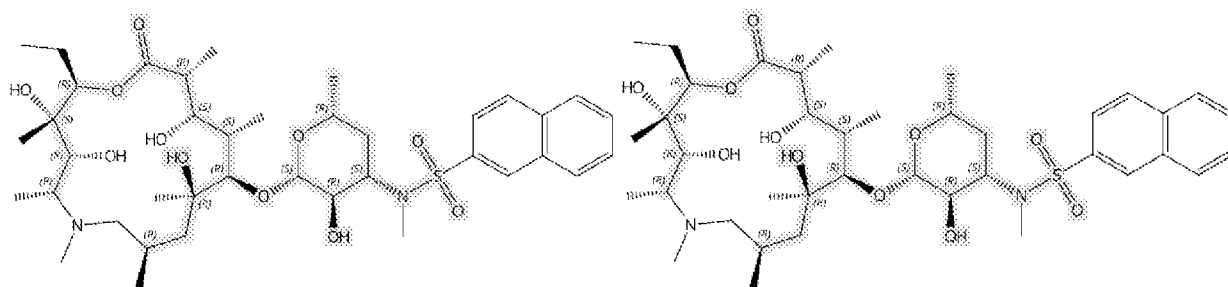
eventually wherein R and R² join to form a bond to form the fused di-oxo-oxathiazole ring that is



as immuno-modulating and anti-inflammatory compounds and devoid of /or having low anti-bacterial activity.

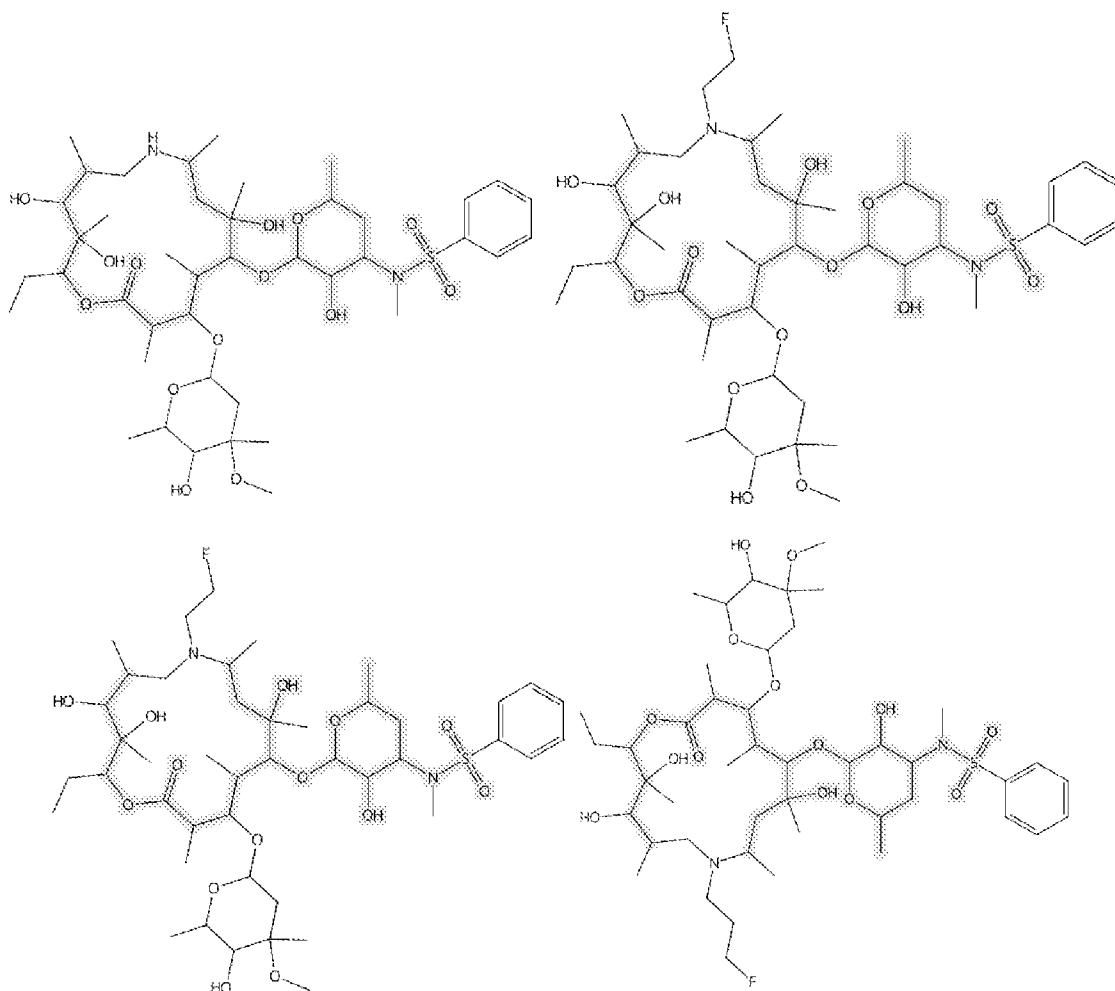
2.2 D1 discloses the following compounds (Ex. 8,9,10,13):

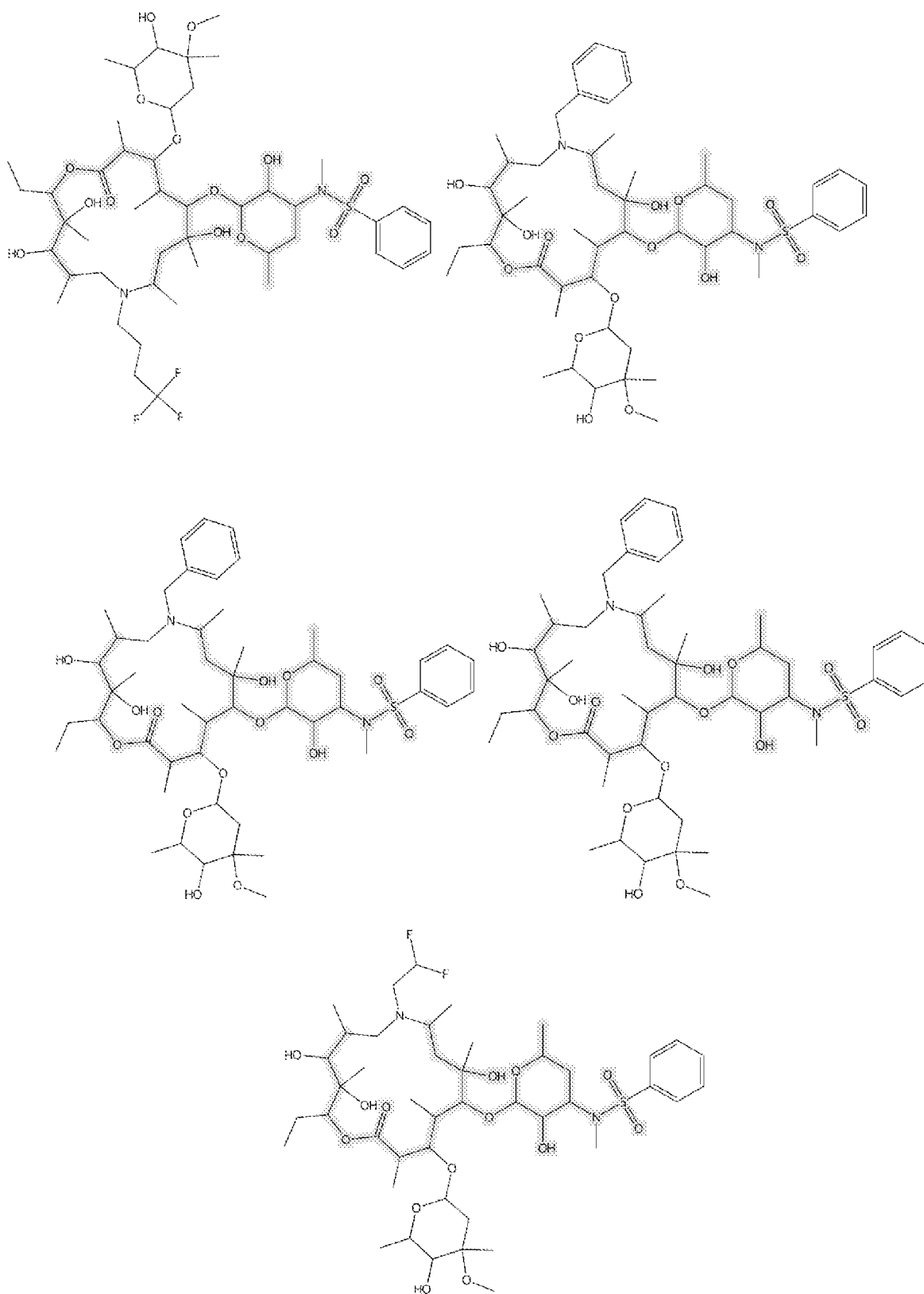




that anticipate claims 1,2,7,12,15-17.

2.3 D2 discloses between examples 54 and 73 the following compounds :





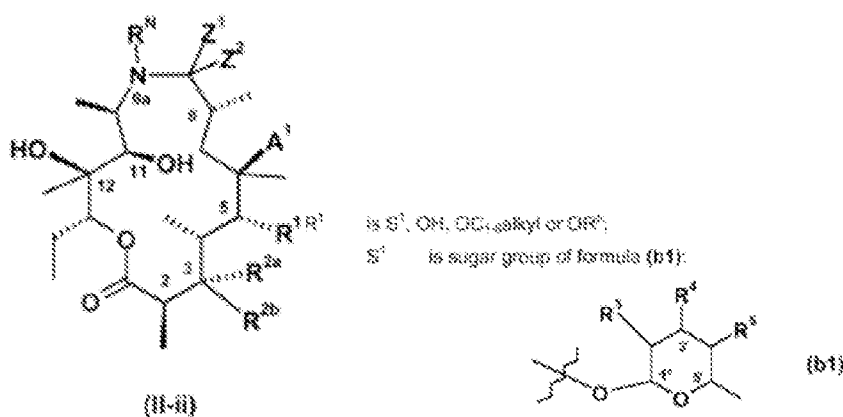
that anticipate claims 1,2,15,17.

- 2.4 D3 discloses on page 515, Fig 2 compounds DTAZ, APSAZ which anticipate claims 1,2,12,15,17.
- 2.5 The remaining documents do not disclose compounds anticipating the claimed subject-matter.

Thus claims 3-6, 9-11, 13, 14 are considered new according to Art. 33(2) PCT.

3 Inventive Step (Art. 33(3) PCT) :

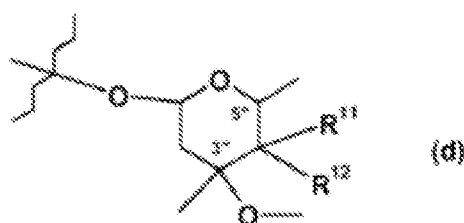
- 3.1 Claims 3-6, 9-11, 14 do not appear to contain any further particular technical feature that could render at first glance the subject-matter of said claims inventive as D4, which appears to concern the same type of compounds with the same desired activity, for ex. compound II-ii in claim 11 :



- R^{2a} is:
- (i) S^2 ;
 - (ii) $-OH$;
 - (iii) $-OC_{1-6}alkyl$;
 - (iv) H ;
 - (v) together with R^{2b} forms a keto group ($=O$);
 - (vi) together with S^2 forms a double bond;
 - (vii) $-OC(=O)Y^1$, wherein Y^1 is G^1 , G^2 , G^3 , G^4 , G^5 or H ; or
 - (viii) $-OR^6$;

R^{2b} is H , together with R^{2a} forms a keto group, together with A^1 forms cyclic hemiketal and R^{2a} is OH , or together with A^1 forms cyclic ether group and R^{2a} is H ;

S^2 is sugar group of formula (d)



with overlapping definitions of R^{11}/R^{12} ,

which basically appear to disclose all the remaining features like the absence of the cladinose or its further substitution.

3.2 As to claim 13, taking D1 as the closest prior art, the claimed subject-matter differs in that the claimed compounds a cyclic $-N-SO_3-$ fused to the desosamine ring.

Since no particular effect is disclosed in the description *re* D1, the problem to be solved may be regarded as the provision of further immuno-modulating and anti-inflammatory compounds and devoid of /or having low anti-bacterial activity.

There does not appear to be any evidence in the description showing any immuno-modulating and anti-inflammatory activities.

The problem to be solved must therefore be requalifies as the provision of further compounds *per se* which is never considered inventive contrary to Art. 33(3) PCT.

Re Item VII

Certain defects in the international application

- 1 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the cited prior art is not mentioned in the description, nor is this document identified therein.

Re Item VIII

Certain observations on the international application

- 1 **Clarity (Art. 6 PCT) :**
 - 1.1 It appears when reading the description that many parameters like for. ex. alkyl groups may eventually be substituted. Nevertheless, this is not reflected in the claims and, as the claims must be understandable by themselves without having to refer to description, any definition that would deviate from what is generally accepted under the IUPAC nomenclature (for ex. the IUPAC definition of an alkyl group does not include substitutions), such "non-standard" definitions should be clearly mentioned in the claims (Art. 6 PCT).
 - 1.2 Concerning claim 9 : the claims may include tables if this is desirable in view of the subject-matter involved. In such cases, the tables must be included in the text of the relevant claim; they may not be annexed to the claims nor may reference be made to tables contained in the description (R.11.10(c) PCT).