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**Declarations under Rule 4.17:**
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**Published:**
— *with international search report (Art. 21(3))*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*
— *with sequence listing part of description (Rule 5.2(a))*

(88) Date of publication of the revised international search report:
18 July 2024 (18.07.2024)

(15) Information about Correction:
see Notice of 18 July 2024 (18.07.2024)

(54) Title: ANTIVIRAL COMPOUNDS AND METHODS OF MAKING AND USE THEREOF

(57) Abstract: Described are analogues of 3'-ketoriboside having antiviral properties and optionally low toxicity. Generally, these compounds contain a 3'-ketoribose, a lower alkyl attached to the 2'-position of the 3'-ketoribose, a nucleobase or analogue thereof attached to the 1'-position of the 3'-ketoribose, and a prodrug side chain attached to the 5'-oxygen of the 3'-ketoribose. The overall structure of these compounds provides stability, viral RNA chain elongation inhibitory property, and hydrogen bond acceptor for recognition by various enzymes for these compounds. Pharmaceutical formulations suitable for the delivery of the compounds to a subject in need thereof are disclosed. The pharmaceutical formulation can be administered by oral administration, parenteral administration, inhalation, and/or mucosal administration. Methods for preventing or treating a viral infection in a subject are also disclosed.

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# INTERNATIONAL SEARCH REPORT

International application No
PCT/US2023/082465

**A. CLASSIFICATION OF SUBJECT MATTER**
INV. C07H19/16 A61P31/14 A61K31/52
ADD.

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 A61P A61K C07H

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 practicable, search terms used)
EPO-Internal, WPI 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 | DENTMON ZACKERY W. ET AL: "Synthesis and Antiviral Evaluation of 2',3'-[beta]-C-Disubstituted Nucleoside Analogue ProTides to Test a Conformational Model of Potency Against Hepatitis C", SYNLETT, vol. 34, no. 13, 27 October 2022 (2022-10-27), pages 1607-1615, XP093133475, DE ISSN: 0936-5214, DOI: 10.1055/a-1904-0249 | 1-5, 10-13,16 |
| Y | abstract<br>page 1610; compound 4<br>page 1609; table 1; compounds 1-13 | 6-9, 19-22 |

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[x] Further documents are listed in the continuation of Box C.

[x] See patent family annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 28 February 2024 | 20/06/2024 |

| Name and mailing address of the ISA/ | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040,<br>Fax: (+31-70) 340-3016 | Bissmire, Stewart |

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Form PCT/ISA/210 (second sheet) (April 2005)

# INTERNATIONAL SEARCH REPORT

International application No.

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**Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)**

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of a sequence listing:

   a. [X] 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.

2. [ ] With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this report has been established to the extent that a meaningful search could be carried out without a WIPO Standard ST.26 compliant sequence listing.

3. Additional comments:

# INTERNATIONAL SEARCH REPORT

International application No
PCT/US2023/082465

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | CN 105 646 629 A (GUANGZHOU HENOVCOM BIOSCIENCE CO LTD)<br>8 June 2016 (2016-06-08)<br>page 28; compound 45<br>----- | 1-5 |
| Y | ELDRUP A B ET AL: "Structure-Activity Relationship of Purine Ribonucleosides for Inhibition of Hepatitis C Virus RNA-Dependent RNA Polymerase",<br>JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY, US,<br>vol. 47, no. 9,<br>1 January 2004 (2004-01-01), pages 2283-2295, XP002391265,<br>ISSN: 0022-2623, DOI: 10.1021/JM030424E<br>abstract<br>page 2284; tables 1, 2; compounds 1-12<br>----- | 6-9,<br>19-22 |

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# INTERNATIONAL SEARCH REPORT

**Information on patent family members**

**International application No**
PCT/US2023/082465

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| CN 105646629 A | 08-06-2016 | NONE | |