



(51) International Patent Classification:

C07K 16/08 (2006.01) C12N 15/86 (2006.01)
A61K 39/42 (2006.01) A61K 39/00 (2006.01)
A61P 1/16 (2006.01)

(21) International Application Number:

PCT/US2024/032725

(22) International Filing Date:

06 June 2024 (06.06.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/506,582 27 June 2023 (27.06.2023) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

(54) Title: METHODS FOR REDUCING HEPATITIS B VIRUS SURFACE ANTIGEN (HBsAg) AND DRUGS USED IN THE METHODS THEREOF

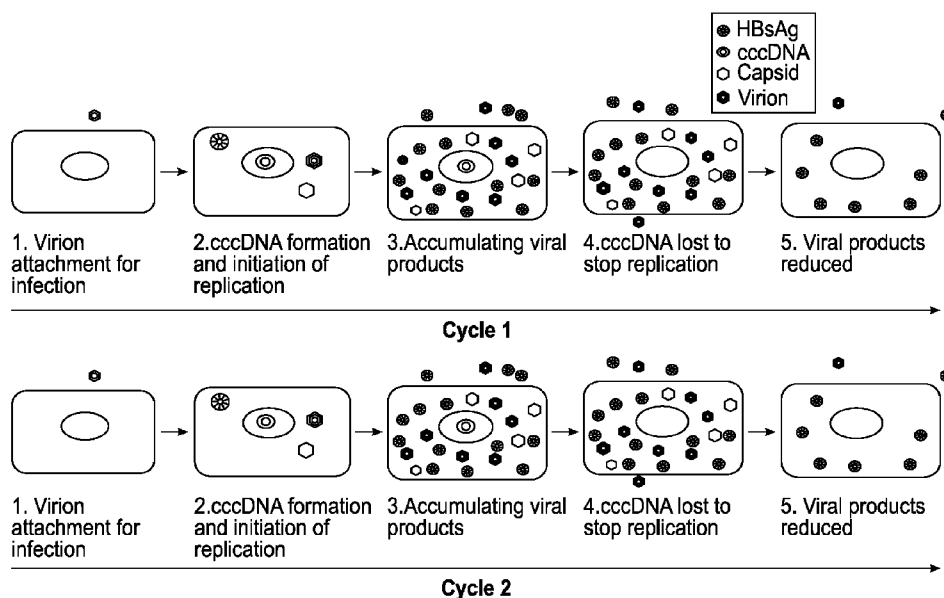


FIG. 11A

(57) Abstract: A method of curing chronic hepatitis B infection in humans is provided, the method including administering to a subject in need thereof, an effective amount of one or both of an exogenous anti-HBs antibody or an anti-HBs antibody producing vector to reduce cellular and blood hepatitis B surface antigen (HBsAg), by providing a sustained elevated level of anti-HBs antibody in the subject.

Published:

- *with international search report (Art. 21(3))*
- *with sequence listing part of description (Rule 5.2(a))*

(88) Date of publication of the international search report:
13 February 2025 (13.02.2025)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2024/032725

A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. C07K 16/08; A61K 39/42; A61P 1/16; C12N 15/86 (2024.01)

ADD. A61K 39/00 (2024.01)

CPC - INV. C07K 16/082; A61K 39/42; A61P 1/16; C12N 15/86

ADD. A61K 2039/505; A61K 2039/5256; A61K 2039/545; C07K 2317/76; C12N 2320/31; C12N 2740/15011

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)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic database consulted during the international search (name of database and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 11,136,378 B2 (ZHANG) 05 October 2021; abstract; column 5, lines 21-23; 33-40; column 7, lines 43-56; column 8, lines 4-22, 32-34; column 9, lines 27-43, 55-58; column 12, lines 52-54, 58-64, 66-67 and column 13, lines 1-2; claims 1-2 and 10-11; fig. 3	1-2, 6-9 and 23-24
Y	52-54, 58-64, 66-67 and column 13, lines 1-2; claims 1-2 and 10-11; fig. 3	3-5 and 22
Y	VANWOLLEGHEM. "Humoral immunity in hepatitis B virus infection: Rehabilitating the B in HBV" 1-11. JHEP Reports. Web. 19 November 2021; <Entire Document>; <DOI: 10.1016/j.jhepr.2021.100398>	3-5
Y	WO 2022/029209 A1 (F. HOFFMANN-LA ROCHE AG) 10 February 2022; abstract; paragraphs [00148]-[00149], [00157] and [00164]	22
P,Y	WO 2023/122555 A2 (HBVTECH, LLC) 29 June 2023; Entire Document	1-9 and 22-24
A	ZHANG. "Increasing Heterogeneity of the 'a' Determinant of HBsAg Found in the Presumed Late Phase of Chronic Hepatitis B Virus Infection" 9-15. Scandinavian Journal of Infectious Diseases. Web. 08 July 2009; <Entire Document>; <DOI: https://doi.org/10.3109/00365549609027142>	1-9 and 22-24



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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

"D" document cited by the applicant in the international application

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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"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

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

15 August 2024 (15.08.2024)

Date of mailing of the international search report

SEP 17 2024

Name and mailing address of the ISA/

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents

P.O. Box 1450, Alexandria, Virginia 22313-1450

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2024/032725

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. ☒ 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.
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/US2024/032725

Box No. 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:
3. ☒ Claims Nos.: 10-21, 25-27
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. 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 additional fees, this Authority did not invite payment of additional fees.
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 and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.