



(51) International Patent Classification:

A61K 9/16 (2006.01) A61K 9/00 (2006.01)
A61K 38/00 (2006.01) C12N 15/11 (2006.01)
A61P 27/02 (2006.01) A61K 9/50 (2006.01)

(21) International Application Number:

PCT/US2023/069364

(22) International Filing Date:

29 June 2023 (29.06.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/357,631 30 June 2022 (30.06.2022) US

(71) Applicant: IVERIC BIO, INC. [US/US]; 8 Sylvan Way, Parsippany, New Jersey 07054 (US).

(72) Inventors: COOK, Gary; c/o IVERIC bio, Inc., 8 Sylvan Way, Parsippany, New Jersey 07054 (US). DUGEL, Pravin; c/o IVERIC bio, Inc., 8 Sylvan Way, Parsippany, New Jersey 07054 (US). ASSMUTH, Tatu; c/o IVERIC

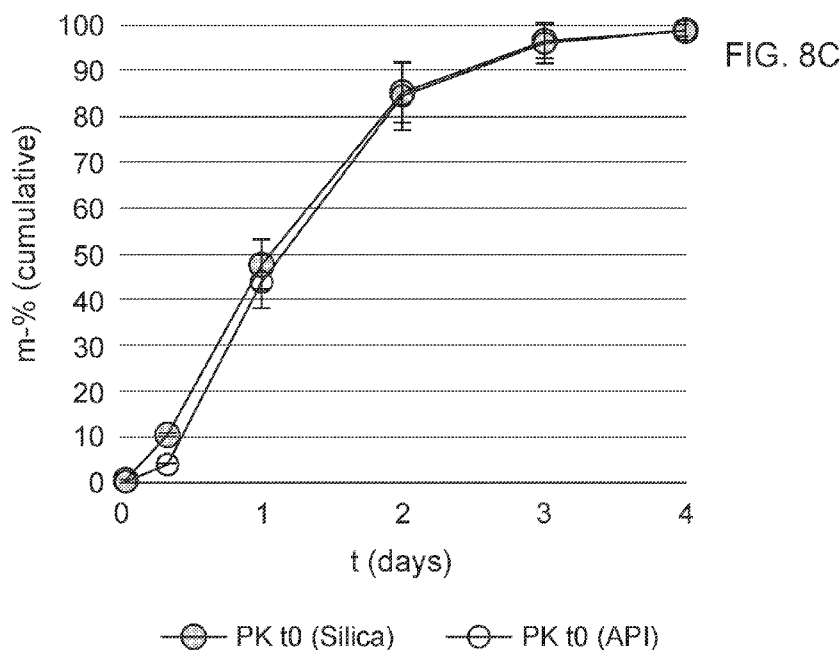
bio, Inc., 8 Sylvan Way, Parsippany, New Jersey 07054 (US).

(74) Agent: ELRIFI, Ivor et al.; Cooley LLP, 1299 Pennsylvania Ave., NW, Suite 700, Washington, District of Columbia 20004 (US).

(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,

(54) Title: SUSTAINED RELEASE SILICA HYDROGEL COMPOSITES FOR TREATING OPHTHALMOLOGICAL CONDITIONS AND METHODS OF USING SAME



(57) Abstract: The present disclosure relates to a sustained release silica hydrogel composite comprising an anti-complement agent and methods of using same to treat ophthalmological conditions. The anti-complement agent may be an anti-C5 agent comprising a C5-specific aptamer.

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).

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 international search report:

01 February 2024 (01.02.2024)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2023/069364

A. CLASSIFICATION OF SUBJECT MATTER		
INV.	A61K9/16	A61K38/00
	A61P27/02	A61K9/00
	A61K9/50	C12N15/11
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)		
A61K A61P		
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, EMBASE, BIOSIS		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	AU 2022 201 404 A1 (IVERIC BIO INC [US]) 24 March 2022 (2022-03-24) claims 1-29 paragraph [0183] - paragraph [0309] paragraph [0359] - paragraph [0360] -----	1-27
Y	CN 105 431 204 A (OPHTHOTECH CORP) 23 March 2016 (2016-03-23) the whole document -----	1-27
Y	WO 2019/040397 A1 (OPHTHOTECH CORP [US]) 28 February 2019 (2019-02-28) paragraph [0049] - paragraph [0052] claims 1-19 example 1 sequence 1 ----- -/--	1-27
☒ 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 "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		Date of mailing of the international search report
12 December 2023		04/01/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Schifferer, Hermann

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2023/069364

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009/214538 A1 (FUNG SEK CHUNG [US] ET AL) 27 August 2009 (2009-08-27) claims 1-49 paragraph [0134] -----	1-27
Y	AU 2013 204 622 A1 (ARCHEMIX LLC) 9 May 2013 (2013-05-09) paragraph [0097] - paragraph [0103] paragraph [0117] - paragraph [0118] paragraph [0153] paragraph [0394] - paragraph [0424] example 7 claims 1-21 -----	1-27

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2023/069364

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 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

Information on patent family members

International application No

PCT/US2023/069364

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
AU 2022201404 A1	24-03-2022	AU 2014286996 A1	07-01-2016
		AU 2020201824 A1	02-04-2020
		AU 2022201404 A1	24-03-2022
		BR 112016000546 A2	21-11-2017
		CA 2915255 A1	15-01-2015
		CA 3107182 A1	15-01-2015
		CL 2016000055 A1	07-10-2016
		CN 105431204 A	23-03-2016
		CN 110193009 A	03-09-2019
		EA 201690212 A1	30-06-2016
		EP 3019243 A1	18-05-2016
		EP 3628373 A1	01-04-2020
		HK 1223319 A1	28-07-2017
		IL 278018 A	30-11-2020
		IL 294463 A	01-09-2022
		JP 2016531901 A	13-10-2016
		JP 2018168175 A	01-11-2018
		JP 2020158533 A	01-10-2020
		JP 2022153570 A	12-10-2022
		KR 20160030396 A	17-03-2016
		KR 20220061248 A	12-05-2022
		KR 20230152151 A	02-11-2023
		PH 12015502773 A1	21-03-2016
		SG 10201708882T A	28-12-2017
		SG 10201912985R A	27-02-2020
		SG 11201510315T A	28-01-2016
		US 2015017163 A1	15-01-2015
		US 2016296550 A1	13-10-2016
		US 2019381087 A1	19-12-2019
		US 2021369757 A1	02-12-2021
		US 2022175813 A1	09-06-2022
		US 2023364122 A1	16-11-2023
		US 2023364123 A1	16-11-2023
		WO 2015006734 A1	15-01-2015
CN 105431204 A	23-03-2016	AU 2014286996 A1	07-01-2016
		AU 2020201824 A1	02-04-2020
		AU 2022201404 A1	24-03-2022
		BR 112016000546 A2	21-11-2017
		CA 2915255 A1	15-01-2015
		CA 3107182 A1	15-01-2015
		CL 2016000055 A1	07-10-2016
		CN 105431204 A	23-03-2016
		CN 110193009 A	03-09-2019
		EA 201690212 A1	30-06-2016
		EP 3019243 A1	18-05-2016
		EP 3628373 A1	01-04-2020
		HK 1223319 A1	28-07-2017
		IL 278018 A	30-11-2020
		IL 294463 A	01-09-2022
		JP 2016531901 A	13-10-2016
		JP 2018168175 A	01-11-2018
		JP 2020158533 A	01-10-2020
		JP 2022153570 A	12-10-2022
		KR 20160030396 A	17-03-2016
		KR 20220061248 A	12-05-2022
		KR 20230152151 A	02-11-2023
		PH 12015502773 A1	21-03-2016

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2023/069364

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		SG 10201708882T A	28-12-2017
		SG 10201912985R A	27-02-2020
		SG 11201510315T A	28-01-2016
		US 2015017163 A1	15-01-2015
		US 2016296550 A1	13-10-2016
		US 2019381087 A1	19-12-2019
		US 2021369757 A1	02-12-2021
		US 2022175813 A1	09-06-2022
		US 2023364122 A1	16-11-2023
		US 2023364123 A1	16-11-2023
		WO 2015006734 A1	15-01-2015
WO 2019040397	A1	28-02-2019	NONE
US 2009214538	A1	27-08-2009	AU 2006311803 A1 18-05-2007
		BR PI0619657 A2	08-11-2011
		CA 2624393 A1	18-05-2007
		CA 2903896 A1	18-05-2007
		CN 101355956 A	28-01-2009
		CN 107929731 A	20-04-2018
		CR 10041 A	03-12-2008
		DK 2500030 T3	19-10-2015
		EC SP088500 A	30-07-2008
		EP 1942922 A2	16-07-2008
		EP 2500030 A2	19-09-2012
		EP 2998318 A1	23-03-2016
		EP 3299027 A1	28-03-2018
		ES 2551202 T3	16-11-2015
		HK 1175718 A1	12-07-2013
		HK 1223106 A1	21-07-2017
		HU E026423 T2	30-05-2016
		IL 190547 A	30-03-2017
		IL 263237 A	31-12-2018
		JP 2009280626 A	03-12-2009
		JP 2009514888 A	09-04-2009
		JP 2013049724 A	14-03-2013
		JP 2015083609 A	30-04-2015
		JP 2015157862 A	03-09-2015
		JP 2017095522 A	01-06-2017
		JP 2019043963 A	22-03-2019
		KR 20080065693 A	14-07-2008
		KR 20130137716 A	17-12-2013
		KR 20150055628 A	21-05-2015
		KR 20170002684 A	06-01-2017
		KR 20180002911 A	08-01-2018
		KR 20190026048 A	12-03-2019
		MA 29976 B1	03-11-2008
		MX 337061 B	11-02-2016
		MX 360959 B	23-11-2018
		MY 151064 A	31-03-2014
		NZ 567483 A	27-04-2012
		NZ 594285 A	22-02-2013
		PH 12013501270 A1	01-02-2016
		PL 2500030 T3	31-12-2015
		PT 2500030 E	24-09-2015
		RU 2010152367 A	27-06-2012
		SG 10201804008U A	28-06-2018
		SI 2500030 T1	30-10-2015

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2023/069364

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		UA 99591 C2	10-09-2012
		US 2009214538 A1	27-08-2009
		US 2014335078 A1	13-11-2014
		US 2018334495 A1	22-11-2018
		WO 2007056227 A2	18-05-2007
		ZA 200803659 B	29-07-2009
		ZA 201300649 B	29-10-2014
AU 2013204622 A1	09-05-2013	AU 2013204622 A1	09-05-2013
		AU 2022202115 A1	14-04-2022