

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 1184965006WO	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2019/063551	International filing date (<i>day/month/year</i>) 27 Nov 2019	(Earliest) Priority Date (<i>day/month/year</i>) 29 Nov 2018
Applicant XGENOMES CORP.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 8 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out 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)).

b. This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (see Box No. II).

3. **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. _____

as suggested by the applicant.

as selected by this Authority, because the applicant failed to suggest a figure.

as selected by this Authority, because this figure better characterizes the invention.

b. none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2019/063551

A. CLASSIFICATION OF SUBJECT MATTER
 IPC (20200101) C12Q 1/6876, C12Q 1/6874, G16B 30/20
 CPC (20180501) C12Q 1/6876, C12Q 1/6874, G16B 30/20
 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)
 IPC (20200101) C12Q 1/6876, C12Q 1/6874, G16B 30/20
 CPC (20180501) C12Q 1/6876, C12Q 1/6874, G16B 30/20

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)
 Databases consulted: Esp@cenet, Google Patents, CAPLUS, BIOSIS, EMBASE, MEDLINE, Google Scholar, Orbit
 Search terms used: optical sequencing, DNA, long reads, single molecule, multiple primers, merging

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6221592 B1 WISCONSIN ALUMI RESEARCH FOUNDATION 24 Apr 2001 (2001/04/24) whole document, especially abstract; claims 19, 23, 48-50; column 20, lines 18-20; column 34, lines 19-48; figure 16	1,4,6-16,18,22-24,27,42,55,56
Y	whole document, especially abstract; claims 19, 23, 48-50; column 20, lines 18-20; column 34, lines 19-48; figure 16	2,3,19-21,25,26,28-41,43,44,46,49-54
X	US 2018327829 A1 Mir Kalim U 15 Nov 2018 (2018/11/15) whole document, especially claims 1, 6-8, 16, 20; description paragraphs [0161], [0289], [0495], [0601]	1,4-10,13-17,45,47,48
Y	whole document, especially claims 1, 6-8, 16, 20; description paragraphs [0161], [0289], [0495], [0601]	2,3,25,26,28-39,43,44,46,52-54

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 16 Mar 2020	Date of mailing of the international search report 16 Mar 2020
--	---

Name and mailing address of the ISA: Israel Patent Office Technology Park, Bldg.5, Malcha, Jerusalem, 9695101, Israel Email address: pctoffice@justice.gov.il	Authorized officer MAZEL Alexander Telephone No. 972-73-3927174
--	---

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2019/063551

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2004070005 A2 454 CORPORATION, ; CHEN, YI-JU, ; LEAMON, JOHN, H, ; LOHMAN, KENTON, ; RONAN, MICHAEL, T, ; SRINIVASAN, MAITHREYAN, ; ROTHBERG, JONATHAN, ; WEINER, MICHAEL 19 Aug 2004 (2004/08/19) whole document, especially claim 1; page 8, line 12 – page 9, line 2; page 9, line 24 – page 10, line 11; page 13, line 23 – page 14 line 25; page 18, lines 3-11; figure 1 (B-E).	19-21,40,41,49-51
Y	Levy-Sakin, M., & Ebenstein, Y. (2013). Beyond sequencing: optical mapping of DNA in the age of nanotechnology and nanoscopy. <i>Current opinion in biotechnology</i> , 24(4), 690-698. 18 Feb 2013 (2013/02/18) whole document, especially page 694, left column (first full paragraph – left column, first paragraph); figures 2, 3	53,54
A	Neely, R. K., Dedecker, P., Hotta, J. I., Urbanaviciute, G., Klimasauskas, S., & Hofkens, J. (2010). DNA fluorocode: A single molecule, optical map of DNA with nanometre resolution. <i>Chemical Science</i> , 1(4), 453-460. 11 Aug 2020 (2020/08/11) whole document, especially abstract; page 455, left column, second paragraph	54
A	Rhoads, A., & Au, K. F. (2015). PacBio sequencing and its applications. <i>Genomics, proteomics & bioinformatics</i> , 13(5), 278-289. 02 Nov 2015 (2015/11/02) whole document	1-56

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/US2019/063551

Patent document cited search report	Publication date	Patent family member(s)	Publication Date
US 6221592 B1	24 Apr 2001	US 6221592 B1	24 Apr 2001
		US 2002061523 A1	23 May 2002
		US 6607888 B2	19 Aug 2003
		US 2003087280 A1	08 May 2003
		WO 02086166 A1	31 Oct 2002
US 2018327829 A1	15 Nov 2018	US 2018327829 A1	15 Nov 2018
		CN 108603227 A	28 Sep 2018
		EP 3411494 A1	12 Dec 2018
		EP 3411494 A4	11 Mar 2020
		WO 2017087823 A1	26 May 2017
WO 2004070005 A2	19 Aug 2004	WO 2004070005 A2	19 Aug 2004
		WO 2004070005 A3	11 Nov 2004
		WO 2004070005 B1	20 Jan 2005
		AT 437945 T	15 Aug 2009
		AT 448302 T	15 Nov 2009
		AT 461291 T	15 Apr 2010
		AT 546525 T	15 Mar 2012
		AU 2004209001 A1	19 Aug 2004
		AU 2004209001 B2	11 Oct 2007
		AU 2004209416 A1	19 Aug 2004
		AU 2004209416 B2	02 Aug 2007
		AU 2004209426 A1	19 Aug 2004
		AU 2004209426 B2	17 Apr 2008
		AU 2004254552 A1	13 Jan 2005
		AU 2004254552 B2	24 Apr 2008
		CA 2513535 A1	19 Aug 2004
		CA 2513535 C	12 Jun 2012
		CA 2513541 A1	19 Aug 2004

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/US2019/063551

Patent document cited search report	Publication date	Patent family member(s)	Publication Date
		CA 2513889 A1	19 Aug 2004
		CA 2513899 A1	13 Jan 2005
		CA 2513899 C	26 Mar 2013
		CA 2616762 A1	02 Aug 2007
		CA 2727850 A1	13 Jan 2005
		CA 2727850 C	30 Apr 2013
		CA 2728746 A1	13 Jan 2005
		CA 2728746 C	16 Jan 2018
		CA 2773059 A1	19 Aug 2004
		CA 2773059 C	31 Mar 2015
		CN 101128601 A	20 Feb 2008
		CN 101128601 B	08 Jun 2011
		CN 101278295 A	01 Oct 2008
		CN 102212614 A	12 Oct 2011
		CN 102212614 B	25 Dec 2013
		DE 602004022253 D1	10 Sep 2009
		DE 602004024034 D1	24 Dec 2009
		DE 602004026033 D1	29 Apr 2010
		DE 602004036672 C5	29 Nov 2012
		EP 1590477 A2	02 Nov 2005
		EP 1590477 A4	09 Apr 2008
		EP 1590477 B1	29 Jul 2009
		EP 1594950 A2	16 Nov 2005
		EP 1594950 A4	25 Jul 2007
		EP 1594980 A2	16 Nov 2005
		EP 1594980 A4	02 May 2007
		EP 1594980 B1	11 Nov 2009
		EP 1594980 B2	16 Aug 2017
		EP 1594981 A2	16 Nov 2005
		EP 1594981 A4	05 Mar 2008
		EP 1594981 B1	17 Mar 2010

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/US2019/063551

Patent document cited search report	Publication date	Patent family member(s)	Publication Date
	EP 1922664	A2	21 May 2008
	EP 1997889	A2	03 Dec 2008
	EP 1997889	A3	23 Sep 2009
	EP 2145955	A2	20 Jan 2010
	EP 2145955	A3	30 Mar 2011
	EP 2145955	B1	22 Feb 2012
	EP 2159285	A2	03 Mar 2010
	EP 2159285	A3	29 Jun 2011
	EP 2159285	B1	26 Sep 2012
	EP 2261372	A2	15 Dec 2010
	EP 2261372	A3	06 Apr 2011
	EP 2261372	B1	22 Aug 2012
	ES 2330339	T3	09 Dec 2009
	ES 2338654	T3	11 May 2010
	ES 2338654	T5	11 Dec 2017
	ES 2342665	T3	12 Jul 2010
	ES 2380893	T3	21 May 2012
	ES 2396245	T3	20 Feb 2013
	JP 2007523627	A	23 Aug 2007
	JP 4473878	B2	02 Jun 2010
	JP 2006515522	A	01 Jun 2006
	JP 4480715	B2	16 Jun 2010
	JP 2007535892	A	13 Dec 2007
	JP 4768598	B2	07 Sep 2011
	JP 2010178744	A	19 Aug 2010
	JP 5258822	B2	07 Aug 2013
	JP 2012231799	A	29 Nov 2012
	JP 5495399	B2	21 May 2014
	JP 2013066475	A	18 Apr 2013
	JP 5726155	B2	27 May 2015
	JP 2007525151	A	06 Sep 2007

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/US2019/063551

Patent document cited search report	Publication date	Patent family member(s)	Publication Date
		JP 2009502202 A	29 Jan 2009
		JP 2010142233 A	01 Jul 2010
		JP 2013090635 A	16 May 2013
		US 2006134633 A1	22 Jun 2006
		US 7244567 B2	17 Jul 2007
		US 2005130173 A1	16 Jun 2005
		US 7323305 B2	29 Jan 2008
		US 2006040297 A1	23 Feb 2006
		US 7575865 B2	18 Aug 2009
		US 2005079510 A1	14 Apr 2005
		US 7842457 B2	30 Nov 2010
		US 2008132693 A1	05 Jun 2008
		US 8012690 B2	06 Sep 2011
		US 2011009275 A1	13 Jan 2011
		US 8158359 B2	17 Apr 2012
		US 2011201526 A1	18 Aug 2011
		US 8748102 B2	10 Jun 2014
		US 2013078638 A1	28 Mar 2013
		US 8765380 B2	01 Jul 2014
		US 2009048124 A1	19 Feb 2009
		US 8790876 B2	29 Jul 2014
		US 2016298175 A1	13 Oct 2016
		US 10240192 B2	26 Mar 2019
		US 2004185484 A1	23 Sep 2004
		US 2009011959 A1	08 Jan 2009
		US 2012238475 A1	20 Sep 2012
		US 2014162885 A1	12 Jun 2014
		US 2015099672 A1	09 Apr 2015
		US 2019203263 A1	04 Jul 2019
		WO 2004069849 A2	19 Aug 2004
		WO 2004069849 A3	24 Mar 2005

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/US2019/063551

Patent document cited search report	Publication date	Patent family member(s)	Publication Date
		WO 2004069849 A8	19 Apr 2007
		WO 2004070007 A2	19 Aug 2004
		WO 2004070007 A3	22 Dec 2005
		WO 2005003375 A2	13 Jan 2005
		WO 2005003375 A3	23 Aug 2007
		WO 2007086935 A2	02 Aug 2007
		WO 2007086935 A3	15 Nov 2007
		WO 2007086935 A8	15 May 2008