



(51) International Patent Classification:
C12Q 1/68 (2006.01)

(21) International Application Number:
PCT/US2009/001926

(22) International Filing Date:
27 March 2009 (27.03.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/072,160 28 March 2008 (28.03.2008) US
61/099,696 24 September 2008 (24.09.2008) 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, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

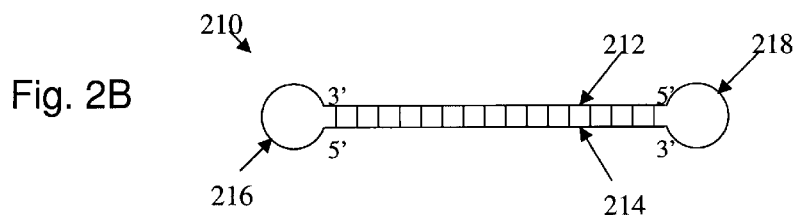
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT,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

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))

(88) Date of publication of the international search report:
7 January 2010

(54) Title: COMPOSITIONS AND METHODS FOR NUCLEIC ACID SEQUENCING



(57) Abstract: Compositions and methods for nucleic acid sequencing include template constructs that comprise double stranded portions in a partially or completely contiguous constructs, to provide for redundant sequence determination through one or both of sequencing sense and antisense strands, and iteratively sequencing the entire construct multiple times. Additional sequence components are also optionally included within such template constructs. Methods are also provided for the use and preparation of these constructs as well as sequencing compositions for their application.

A. CLASSIFICATION OF SUBJECT MATTER*C12Q 1/68(2006.01)i*

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: C12Q

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)

e-KOMPASS(KIPO internal), PubMed, Google, and key words: sequence, determination, linking oligonucleotide, etc.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 2007/003017 A1 (BIOCHIP INNOVATIONS PTY LTD) Jan. 11, 2007 (See pages 1 to 2, Figs 1 - 6, and claims)	1, 2, 4, 6, 9-11, 30 3, 5, 7, 8, 12-29, 31-48
X A	US 2007/0269825 A1 (ATILA BIOSYSTEMS, INC.) Nov. 22, 2007 (See page 1, Figs. 1 - 6, and claims)	1, 2, 4, 6, 9-11, 30 3, 5, 7-8, 12-29, 31-48
X A	US 2004/0203008 A1 (TAKASHI UEMORI et al.) Oct. 14, 2004 (See page 1, claims 1 - 22)	1, 2, 4, 6, 9-11, 30 3, 5, 7-8, 12-29, 31-48
X A	US 6210891 B1 (PYROSEQUENCING AB) Apr. 3, 2001 (See columns 1 - 2, claims 1 to 11)	1, 2, 4, 6, 9-11, 30 3, 5, 7-8, 12-29, 31-48
X A	EP 1225234 B1 (AGILENT TECHNOLOGIES, INC.) Nov. 7, 2007 (See pages 1 - 2, Figs. 1 - 7, claims 1 - 23)	1, 2, 4, 6, 9-11, 30 3, 5, 7-8, 12-29, 31-48



Further documents are listed in the continuation of Box C.



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Date of the actual completion of the international search

17 NOVEMBER 2009 (17.11.2009)

Date of mailing of the international search report

17 NOVEMBER 2009 (17.11.2009)

Name and mailing address of the ISA/KR

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gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

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Telephone No. 82-42-481-8655



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/001926

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2007-003017 A1	11.01.2007	AU 2006-265698 A1 CA 2614042 A1 CN 101248191 A EP 1910558 A4 EP 1910558 A1 JP 2008-544756 T JP 2008-544756 A KR 10-2008-0047355 A US 2008-199872 A1	06.07.2006 11.01.2007 20.08.2008 19.11.2008 16.04.2008 11.12.2008 11.12.2008 28.05.2008 21.08.2008
US 2007-269825 A1	22.11.2007	None	
US 2004-0203008 A1	14.10.2004	AU 2001-96027 A1 AU 9602701 A CN 1483082 A CN 1250743 C CN 1483082 C0 EP 1331275 A4 EP 1331275 A1 JP 04-284063 B2 WO 2002-036822 A1 KR 10-0735137 B1 WO 2002-036822 A1	30.10.2001 15.05.2002 17.03.2004 12.04.2006 17.03.2004 04.08.2004 30.07.2003 27.03.2009 10.05.2002 03.07.2007 10.05.2002
US 06210891 B1	03.04.2001	AU 4391897 A DE 69706430 D1 DE 69706430 T2 EP 0932700 A1 EP 0932700 B1 GB 9620209 D0 JP 3510272 B2 JP 2001-501092 A JP 03-510272 B2 JP 2001-501092 T WO 1998-013523 A1	17.04.1998 04.10.2001 02.05.2002 04.08.1999 29.08.2001 13.11.1996 22.03.2004 30.01.2001 09.01.2004 30.01.2001 02.04.1998
EP 1225234 B1	07.11.2007	DE 60223299 D1 EP 1225234 A2 EP 1225234 A3 US 2002-0197618 A1	20.12.2007 24.07.2002 07.07.2004 26.12.2002