(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
6 September 2013 (06.09.2013)

WIPO | PCT

(10) International Publication Number
WO 2013/130714 A1

(51) International Patent Classification:
G01N 15/10 (2006.01)

(21) International Application Number:
PCT/US2013/028170

(22) International Filing Date:
28 February 2013 (28.02.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/605,016 29 February 2012 (29.02.2012) US
13/476,911 21 May 2012 (21.05.2012) US

(71) Applicant: **FLUIDIGM CORPORATION** [US/US]; 7000 Shoreline Court, Suite 100, San Francisco, California 94080 (US).

(72) Inventors; and
(71) Applicants : **FOWLER, Brian** [US/US]; 7000 Shoreline Court, Suite 100, San Francisco, California 94080 (US). **KIMBALL, Jake** [US/US]; 7000 Shoreline Court, Suite 100, San Francisco, California 94080 (US). **MAUNG, Myo Thu** [SG/US]; 7000 Shoreline Court, Suite 100, San Francisco, California 94080 (US). **MAY, Andrew** [GB/US]; 7000 Shoreline Court, Suite 100, San Francisco, California 94080 (US). **NORRIS, Michael C.** [US/US]; 7000 Shoreline Court, Suite 100, San Francisco, California 94080 (US). **TOPPANI, Dominique G.** [FR/US]; 7000 Shoreline Court, Suite 100, San Francisco, California 94080 (US). **UNGER, Marc A.** [US/US]; 7000 Shoreline Court, Suite 100, San Francisco, California 94080 (US). **WANG, Jing** [CN/US]; 7000 Shoreline Court, Suite 100, San Francisco, California 94080 (US). **WEST, Jason A. A.** [US/US]; 7000 Shoreline Court, Suite 100, San Francisco, California 94080 (US).

(74) Agent: **HOLLAND & HART LLP**; David B. Wilson, P. O. Box 8749, Denver, Colorado 80201 (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, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,

[Continued on next page]

(54) Title: METHODS, SYSTEMS, AND DEVICES FOR MULTIPLE SINGLE-CELL CAPTURING AND PROCESSING USING MICROFLUIDICS

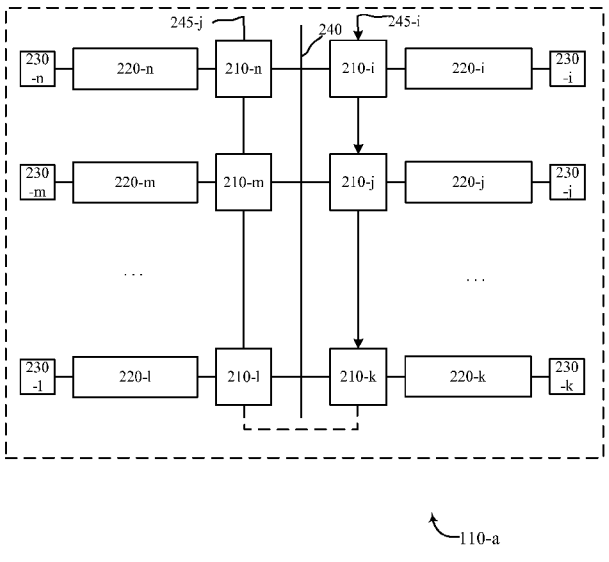


FIG. 2

(57) Abstract: Methods, systems, and devices are described for multiple single-cell capturing and processing utilizing microfluidics. Tools and techniques are provided for capturing, partitioning, and/or manipulating individual cells from a larger population of cells along with generating genetic information and/or reactions related to each individual cell. Different capture configurations may be utilized to capture individual cells and then processing each individual cell in a multi-chamber reaction configuration. Some embodiments may provide for specific target amplification, whole genome amplification, whole transcriptome amplification, real-time PCR preparation, copy number variation, preamplification, mRNA sequencing, and/or haplotyping of the multiple individual cells that have been partitioned from the larger population of cells. Some embodiments may provide for other applications. Some embodiments may be configured for imaging the individual cells or associated reaction products as part of the processing. Reaction products may be harvested and/or further analyzed in some cases.

WO 2013/130714 A1

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, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *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))*