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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
27 May 2010 (27.05.2010)

PCT

(10) International Publication Number
WO 2010/059731 A3

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

(21) International Application Number:
PCT/US2009/064996

(22) International Filing Date:
18 November 2009 (18.11.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/115,704 18 November 2008 (18.11.2008) US

(71) Applicant *(for all designated States except US)*: **BIO-NANOMATRIX, INC.** [US/US]; 3701 Market Street, 4th Floor, Philadelphia, PA 19104 (US).

(72) Inventor; and
(71) Applicant : **BOYCE-JACINO, Michael** [US/US]; 2 Clark Court, Titusville, NJ 08560 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **XIAO, Ming** [US/US]; 3528 Walsh Lane, Huntington Valley, PA 19006 (US). **CAO, Han** [CN/US]; 2001 Hamilton Street - suite 2009, Philadelphia, PA 19130 (US). **DESHPANDE, Parikshit, A.** [CA/US]; 101 Lassen Court - Apt. 4, Princeton, NJ 08540 (US).

(74) Agents: **CALDWELL, John, W.** et al.; Woodcock Washburn LLP, Cira Centre, 12th Floor, 2929 Arch Street, Philadelphia, PA 19104-2891 (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, 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, PE, 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, 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 applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

[Continued on next page]

(54) **Title**: POLYNUCLEOTIDE MAPPING AND SEQUENCING

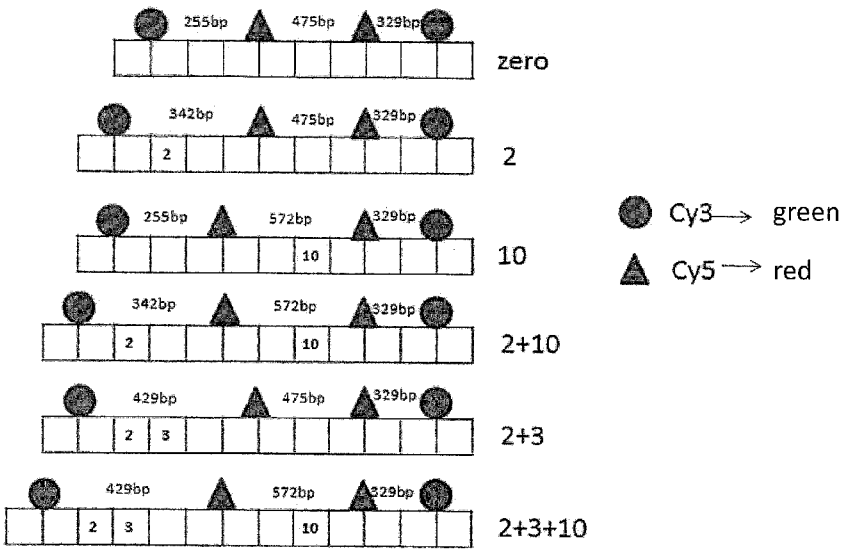


FIG. 2C

(57) **Abstract**: The present invention provides methods of obtaining structural information about a biopolymer sample. The methods include labeling portions of a biopolymer, such as DNA or RNA, linearizing the biopolymer in some cases, and determining the distance between the labels. The user can then compare different samples' between-label distances to qualitatively compare different samples and to assay a given sample for additions or deletions of nucleotides in the regions flanked by the labels. The methods also permit sequencing of biopolymers.

WO 2010/059731 A3

— *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))*

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