



(51) International Patent Classification:
C12Q 1/6804 (2018.01) C12N 15/10 (2006.01)

(21) International Application Number:
PCT/IB2020/062053

(22) International Filing Date:
16 December 2020 (16.12.2020)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
102019000024159 16 December 2019 (16.12.2019) IT

(71) Applicant: **MENARINI SILICON BIOSYSTEMS**
S.P.A. [IT/IT]; Via Giuseppe di Vittorio, 21 B/3, 40013
Castel Maggiore (BO) (IT).

(72) Inventors: **MANARESI, Nicolò**; C/o Menarini Silicon
Biosystems S.P.A., Via Giuseppe di Vittorio, 21 B/3,
40013 Castel Maggiore (BO) (IT). **RASPADORI, Andrea**;
C/o Menarini Silicon Biosystems S.P.A., Via Giuseppe
di Vittorio, 21 B/3, 40013 Castel Maggiore (BO) (IT).
FERRARINI, Alberto; C/o Menarini Silicon Biosystems
S.P.A., Via Giuseppe di Vittorio, 21 B/3, 40013 Castel Mag-
giore (BO) (IT).

(74) Agent: **BOSIA, Alessandra** et al.; c/o STUDIO TORTA
S.p.A., Via Viotti, 9, 10121 Torino (IT).

(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, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN,
KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD,

(54) Title: METHOD AND KIT FOR WHOLE GENOME AMPLIFICATION AND ANALYSIS OF TARGET MOLECULES IN
A BIOLOGICAL SAMPLE

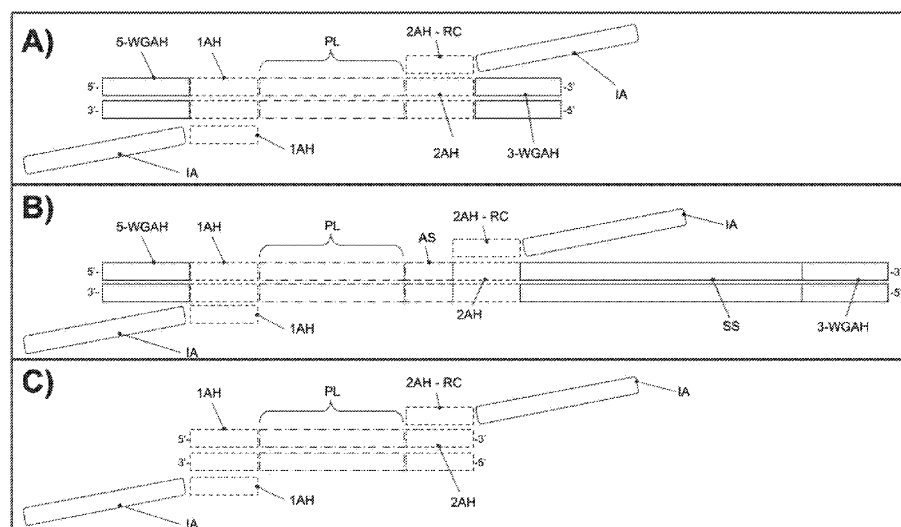


FIG. 9

(57) Abstract: There is disclosed a method for whole genome amplification and analysis of multiple target molecules in a biological sample including genomic DNA and target molecules comprising the steps of contacting the biological sample with at least one binding agent, directed to at least one of the target molecules, conjugated with a tagged oligonucleotide, which comprises a binding-agent barcode sequence (BAB) and a unique molecular identifier sequence (UMI); carrying out a separating step to selectively remove unbound binding agent thus obtaining a labeled biological sample; simultaneously carrying out on the labeled biological sample a whole genome amplification and an amplification of the tagged oligonucleotide; preparing a massively parallel sequencing library from the amplified tagged oligonucleotide; sequencing the massively parallel sequencing library; retrieving the sequences of the BAB and UMI from each sequencing read; counting the number of distinct UMI for each binding agent.

[Continued on next page]

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,
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, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, 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, KM, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- with sequence listing part of description (Rule 5.2(a))
- in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE