

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
29 August 2024 (29.08.2024)



(10) International Publication Number
WO 2024/177564 A1

- (51) **International Patent Classification:**
C12Q 1/6869 (2018.01) *C12Q 1/6886* (2018.01)
- (21) **International Application Number:**
PCT/SG2023/050865
- (22) **International Filing Date:**
29 December 2023 (29.12.2023)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
10202300487P 24 February 2023 (24.02.2023) SG
- (71) **Applicant:** **LUCENCE LIFE SCIENCES PTE. LTD.**
[SG/SG]; 211 Henderson Road, #04-02, Henderson Industrial Park, Singapore 159552 (SG).
- (72) **Inventors:** **PEK, Michelle;** c/o Lucence Life Sciences PTE. LTD., 211 Henderson Road, #04-02, Henderson Industrial Park, Singapore 159552 (SG). **CHEN, Hao;** c/o Lucence Life Sciences PTE. LTD., 211 Henderson Road, #04-02, Henderson Industrial Park, Singapore 159552 (SG). **WAN, Zi Yi;** c/o Lucence Life Sciences PTE. LTD., 211 Henderson Road, #04-02, Henderson Industrial Park, Singapore 159552 (SG). **NGEOW, Kao Chin;** c/o Lucence

Life Sciences PTE. LTD., 211 Henderson Road, #04-02, Henderson Industrial Park, Singapore 159552 (SG). **TAN, Min-Han;** c/o Lucence Life Sciences PTE. LTD., 211 Henderson Road, #04-02, Henderson Industrial Park, Singapore 159552 (SG). **POH, Jonathan;** c/o Lucence Life Sciences PTE. LTD., 211 Henderson Road, #04-02, Henderson Industrial Park, Singapore 159552 (SG).

(74) **Agent:** **SPRUSON & FERGUSON (ASIA) PTE LTD;** P.O. Box 1531, Robinson Road Post Office, Singapore 903031 (SG).

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

(54) **Title:** METHOD FOR SIMULTANEOUS MULTIPLEX DETECTION OF MULTIPLE CANCER-ASSOCIATED ALTERATION AND DETERMINATION OF TISSUE-OF-ORIGIN

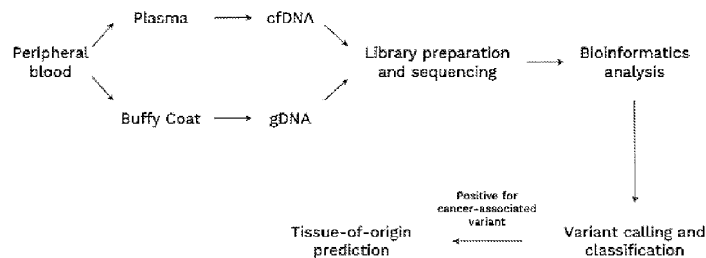


Fig. 1

(57) **Abstract:** Disclosed is a method of detecting one or more cancer-associated alterations and/or determining site of origin of a cancer-associated alteration using nucleic acid from a biological sample. The method comprises (a) extracting nucleic acid from the biological sample; (b) performing multiplexed PCR reactions on the nucleic acid using: a plurality of target capture primer pairs specific to a plurality of target genes comprising one or more cancer-associated alteration, wherein each target capture primer pair comprises a forward primer and a reverse primer, each comprising a target-specific sequence at its 3' end, a barcode sequence linker, and an adapter-specific sequence at its 5' end; (c) sequencing the plurality of amplicons from (b) to obtain a plurality of sequencing reads; and (d) comparing the plurality of sequencing reads with one or more pre-determined reference profile to compute one or more likelihood score, which indicates the probability of a cancer-associated alteration originating from a specific site of origin. Also disclosed is a kit for said method.

[Continued on next page]

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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, ME, 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).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

— *with sequence listing part of description (Rule 5.2(a))*