

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
26 January 2023 (26.01.2023)



(10) International Publication Number
WO 2023/004204 A3

(51) International Patent Classification:
C12Q 1/6883 (2018.01) *C12Q 1/6869* (2018.01)
G16B 30/10 (2019.01)

TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

(21) International Application Number:
PCT/US2022/038244

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))

(22) International Filing Date:
25 July 2022 (25.07.2022)

(25) Filing Language: English

(88) Date of publication of the international search report:
23 February 2023 (23.02.2023)

(26) Publication Language: English

(30) Priority Data:
63/224,873 23 July 2021 (23.07.2021) US
63/324,112 27 March 2022 (27.03.2022) 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, 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, 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,

(54) Title: USE OF CIRCULATING CELL-FREE METHYLATED DNA TO DETECT TISSUE DAMAGE

(57) Abstract: Method of determining if a subject has suffered tissue damage from exposure to a toxic agent. The method comprises sequencing cell-free DNA (cfDNA) in a biospecimen from the subject; determining cellular origin of the cfDNA by identifying methylation patterns in one or more portions of the sequence of the cfDNA that contains methylation sites, in which the cellular origin of the cfDNA is determined when the methylation pattern in the one or more portions is the same as a known cell-type specific methylation patterns; measuring the quantity of the cfDNA of the determined cellular origin, and comparing the measured quantity of the cfDNA of the determined cellular origin with a normal quantity of cfDNA of the determined cellular origin. A greater quantity of the measured cfDNA of the determined cellular origin is indicative that the subject has suffered tissue damage.



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