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(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.



WO 2023/004204 A2