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(54) Title: ANALYSIS OF CELL-FREE DNA IN URINE AND OTHER SAMPLES

(57) Abstract: Diseases (e.g., cancer) of a particular organ can be detected by analyzing cell-free DNA. Some embodiments may use an organ-associated sample that is from a particular organ or passes through the particular organ, as may occur, for example, in urine, saliva, blood, and stool samples. In some embodiments, methylation levels of cell-free DNA can be measured in a sample. Tissue-specific methylation patterns can be used to determine fractional contributions from different tissue types. In other embodiments, sizes of organ-associated cell-free DNA can be measured. A statistical measure of the size profile may indicate that cell-free DNA fragments are collectively longer than expected for subjects with healthy tissue compared to non-healthy tissue. In other embodiments, two different samples can be analyzed to determine whether a particular organ has cancer. Cell-free DNA in a blood sample and organ-associated sample can both be analyzed to identify chromosomal regions exhibiting a copy number aberration.



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