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(54) Title: SYSTEMS AND METHODS FOR DETECTING TUMOR DNA IN MAMMALIAN BLOOD

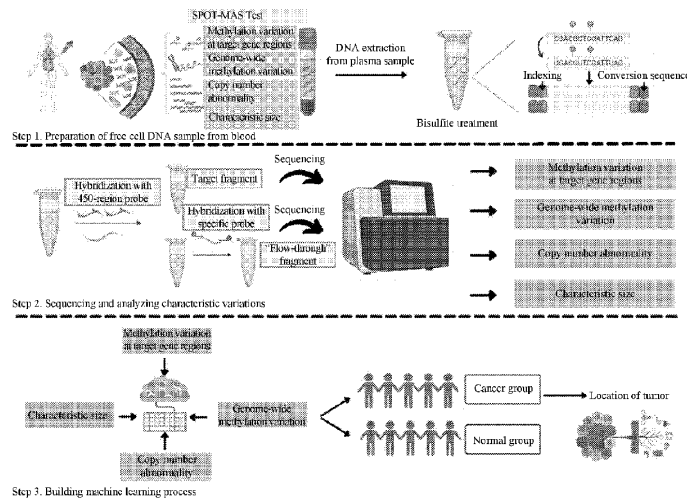


Figure 3

(57) Abstract: Provided are systems and methods for detecting the presence of cancer DNA in blood and for identifying the cancer origin in a test subject. Also provided are systems and methods for monitoring likelihood of cancer recurrence in a subject previously treated for cancer, systems and methods for assessing the efficacy of a cancer treatment in a subject suffering from cancer, and systems and methods for treating cancer in a subject in need thereof. The disclosed systems and methods comprise various elements such as (a) bisulfite treating cell free DNA (cfDNA) from a liquid biopsy sample of the test subject; (b) using the bisulfite treated cfDNA to prepare a first sequencing library for (i) a plurality of specific target genomic regions and (ii) a second sequencing library for a genome of the species of the test subject from a flow through of the first sequencing library; (c) sequencing the prepared first and second sequencing libraries, thereby producing a corresponding first and second plurality of sequencing results; and (d) analyzing the corresponding first

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NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS,
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and second plurality of sequencing results; and (e) receiving output from a machine learning model.