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(54) Title: METHODS AND REAGENTS FOR DETECTING AND ASSESSING GENOTOXICITY

(57) Abstract: Methods, systems, and kits with reagents for assessing genotoxicity, are disclosed herein. Genotoxicity and their mechanisms of action can be determined within a few days of a subject's exposure. Some embodiments of the technology are directed to utilizing Duplex Sequencing for assessing a genotoxic potential of a compound (e.g., a chemical compound) in an exposed subject. Other embodiments of the technology are directed to utilizing Duplex Sequencing for determining a mutation signature associated with a genotoxic agent; and/or a safe threshold level of genotoxin exposure. Additional embodiments of the technology are directed to identifying one or more genotoxic agents a subject may have been exposed to by comparing the subject's DNA mutation spectrum to the mutation spectra of known mutagenic compounds. Once a genotoxin exposure in a subject is identified, or confirmed, then a prophylactic, and/or inhibitory therapeutic course of treatment is provided.



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