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(54) Title: EFFICIENT DIGITAL MEASUREMENT OF LONG NUCLEIC ACID FRAGMENTS

(57) Abstract: Provided are methods and systems that include using multiplexed digital amplification reactions to measure the sizes of a plurality of nucleic acid molecules. In various embodiments, the digital amplification reactions use multiple pairs of separate forward and reverse primer pairs to amplify targeted regions of the nucleic acid molecules, where the targeted regions are separated by a specified number of base pairs. In other embodiments, the digital amplification reactions use multiple primer pairs that share a common pair to amplify targeted regions that overlap with one another. The methods and systems are particularly useful for determining the size distributions of the nucleic acid molecules, or classifying a pathology of a subject from whom the nucleic acid molecules are sampled. Advantageously, the methods and systems can measure the sizes of long nucleic acid molecules without relying on inefficient amplification of very long amplicons.



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