Methods And Apparatuses For Duplicating Genomic Dna With Contiguity Barcodes For De Novo Genome And Epigenome Sequencing

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BACKGROUND

The current generation of sequencers, which are mostly based on sequencing by synthesis using DNA polymerases, are remarkable in terms of sequencing throughput, accuracy, and low cost. However, many technical challenges remain to be overcome to achieve the quality of the genome sequence in terms of per-base accuracy, the contiguity of the assembly and complete phasing of haplotype for personalized medicine.

TECHNOLOGY DESCRIPTION

A research scientist at the University of California, San Diego has developed a method called “Barcoding Contiguity Replication” (BCR) and enabling microfluidic devices for replicating DNA molecules in segments which are hardwired with contiguity information without fragmentation of the original DNA molecules. The technology enables the de novo assembly of both strands of entire individual DNA molecules or chromosomes with 100% contiguity by simple lookup of the contiguity information physically built into the DNA segments in the replication process. Therefore, the invention will enable the de novo sequencing of genome and epigenome from single cells with full haplotype resolution and extremely high accuracy using any existing high-throughput sequencing technologies, including the current generation of short-read sequencing platforms and the emerging nanopore and other single-molecule sequencing platforms.

APPLICATIONS

The invention applications include: DNA and genome sequencing for applications in genetic diagnostics, pathogen detections, biomedical and agriculture research, drug target identification, tailored personalized medical treatment and others.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,428,373	10/01/2019	2013-318

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OTHER INFORMATION

KEYWORDS

dna, rna, nucleic acid, genomics, genome, sequencer, haplotype, diagnostics, genetic, biomedical, targeted, drug

CATEGORIZED AS

- **Biotechnology**
  - Genomics
- **Research Tools**
  - Nucleic Acids/DNA/RNA

RELATED CASES

2013-318-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Methods and Systems for Direct Sequencing of Single DNA Molecules
- A Novel Technique for Fabricating Biomolecular Nano-Arrays Enabling High-DNA Amplification and Sequencing