PacBio Unveils a New Method for Comprehensive, Genome-wide Tandem Repeat Analysis

September 27, 2022

Analysis Method Supports Research on the Genetic Causes of Common Diseases

MENLO PARK, Calif., Sept. 27, 2022 /PRNewswire/ -- PacBio (NASDAQ: PACB), a leading developer of high-quality, highly accurate sequencing solutions, today announced the availability of a new computational analysis method for profiling more than a million tandem repeats (TRs) across the human genome using PacBio's native long-read HiFi sequencing data. The Tandem Repeat Genotyping Tool (TRGT: pronounced as "target") is intended to provide scientists with the ability to obtain a full characterization of the sequence and methylation status of TRs genome-wide. We believe TRGT will enable scientists to better understand the role of known TRs in human disease and could lead to the discovery of novel disease-causing TRs.

Tandem repeats are genetic sequences that are repeated in series, and they can grow in length from parent to child. Importantly, TRs have been linked to many neurological disorders such as ALS and Huntington's disease in addition to the number one cause of inherited mental intellectual disability, Fragile X syndrome.

"We developed TRGT to characterize the genetic and epigenetic variation in one of the most difficult variant classes, tandem repeats" said Michael Eberle, Vice President of Computational Biology at PacBio. "So far, tandem repeats have been understudied due to limitations in the ability of short-read sequencing technologies to sequence these regions of the genome. By combining HiFi sequencing and TRGT, we intend to provide scientists with the ability to explore and characterize these complicated genomic regions and, ultimately, better understand their biological impact."

TRGT is intended to enable research scientists to characterize the sequence composition and structure, repeat unit length, and CpG methylation for each analyzed repeat allele and flanking sequence across the genome. The improved characterization of TR variation may aid in the tertiary analysis for disease causing loci. For example, TRGT can characterize the very long (thousands of base pairs) repeats associated with certain diseases. TRGT can also identify sequence composition changes that are potentially associated with pathogenic expansions in diseases such as cerebellar ataxia with neuropathy and bilateral vestibular areflexia syndrome (CANVAS). Furthermore, because HiFi reads can identify CpG methylation, TRGT can identify hypermethylation signals like those observed with Myotonic Dystrophy expansions.

"The TRGT method is a major improvement on repeat expansion analysis and is helping us to discover new and potentially important variants that may be associated with disease in samples from individuals with inherited disorders," said Stephan Zuchner, MD, PhD, Professor and Chief Genomics Officer of the Miller School of Medicine, University of Miami. Dr. Zuchner and his colleague, Matt Danzi, PhD, Scientist and bioinformatician, are focused on research into the characterization of repeat expansions in healthy and rare disease cohorts.

To improve usability, TRGT also comes with a companion tool, TRVZ, for visualizing the read pileups and methylation data for each repeat allele and flanking sequence analyzed.

TRGT and TRVZ are now available on GitHub: https://github.com/pacificBiosciences/trgt/

About PacBio

Pacific Biosciences of California, Inc. (NASDAQ: PACB) is a premier life science technology company that is designing, developing and manufacturing advanced sequencing solutions to help scientists and clinical researchers resolve genetically complex problems. Our products and technology under development stem from two highly differentiated core technologies focused on accuracy, quality and completeness which include our existing HiFi long read sequencing and our emerging SBB™ short read sequencing technologies. Our products address solutions across a broad set of research applications including human germline sequencing, plant and animal sciences, infectious disease and microbiology, oncology, and other emerging applications. For more information, please visit www.pacb.com and follow @PacBio.

PacBio products are provided for Research Use Only. Not for use in diagnostic procedures.

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looking statements speak only as of the date of this press release and are based on current expectations and involve a number of assumptions, risks and uncertainties that could cause the actual results to differ materially from such forward-looking statements. Readers are strongly encouraged to read the full cautionary statements contained in PacBio's filings with the Securities and Exchange Commission, including the risks set forth in PacBio's Forms 8-K, 10-K, and 10-Q. PacBio disclaims any obligation to update or revise any forward-looking statements.

Contacts

Investors:
Todd Friedman
650.521.8450
ir@pacb.com

Media:
Lizelda Lopez
pr@pacb.com

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