Bionano Genomics Announces Publication of New Approach to Study DNA Replication Using Optical Genome Mapping With Saphyr, Potentially Supporting Development of Cancer Drugs Targeting Replication Pathways

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Publication on novel Saphyr-based method to analyze DNA replication in human genomes could enable new level of cancer research and drug discovery, exemplifies the importance of optical genome mapping in large research market

SAN DIEGO, April 22, 2021 (GLOBE NEWSWIRE) -- Bionano Genomics, Inc. (Nasdaq: BNGO), announced today the publication of a study that analyzed the mechanisms of DNA replication, a fundamental process of cell growth implicated in cancer that was previously hard to study in human genomes. The study, led by Dr. Nicholas Rhind from the University of Massachusetts Medical School with an international team of scientists from France, Canada and the USA, described a method combining optical genome mapping (OGM) with Bionano's Saphyr ® system with a labeling method developed by the scientists. The Saphyr-based method was capable of determining the timing, speed and origin of DNA replication in human cells at a coverage level that is thousands of times higher than what earlier methods such as nanopore sequencing allowed. The breakthrough quality and quantity of single molecule data generated by Saphyr in this study illustrates the importance of novel technologies such as OGM in driving a wave of big biology and innovation in genomics.

The body of humans and other organisms develop and grow when cells divide, and for each division the entire genome needs to be replicated. Mistakes in DNA replication can lead to genome instability and mutations that drive cancer. Because cancer cells divide excessively, many chemotherapeutic drugs target and disrupt DNA replication. A better understanding of these mechanisms could help develop new cancer drugs with reduced side effects.

The study of DNA replication in human cells has been difficult because existing technologies don't allow for a thorough investigation of this extremely complex process in human cells. For that reason, replication studies using single molecule technologies such as nanopore sequencing have typically been limited to yeast cells because the sequencing throughput does not allow the genomewide analysis of human cells. The largest replication study to date analyzed no more than the equivalent of a single fiber for each part of the human genome. In this study, the optical replication mapping with Saphyr was able to collect more than 2,500 fibers for each part of the genome, or 27 million fibers total with an average length that's 10 times larger than previous studies using long-read sequencing. The authors stated that the Saphyr-based method can become "a central technique for studying DNA replication, DNA repair and genome instability."

Erik Holmlin, PhD, CEO of Bionano Genomics commented: "At Bionano we are focused on driving what we believe will be next wave of big biology and innovation in genomics by unlocking access to genome structure, structural variation, and functional information derived from high volume single molecule analysis. For all the transformative technology that's available to researchers and clinicians today, none of them handles genomic structure, location and organization very well. This limitation leaves a gap in the basic understanding of genome function and the search for new medicines and diagnostic tests while other areas of genome analysis are being transformed by new technology. The optical replication mapping described here is a novel application of our technology that contributes to solving unique scientific questions, and illustrates one of the areas of growth for OGM that the research market provides. We are excited about the possibilities for improved insight in cancer biology and the potential discoveries of novel treatments for cancer that this application could enable."

The publication is available at https://www.biorxiv.org/content/10.1101/2020.08.24.263459v3

About Bionano Genomics

Bionano is a genome analysis company providing tools and services based on its Saphyr system to scientists and clinicians conducting genetic research and patient testing, and providing diagnostic testing for those with autism spectrum disorder (ASD) and other neurodevelopmental disabilities through its Lineagen business. Bionano's Saphyr system is a research use only platform for ultra-sensitive and ultra-specific structural variation detection that enables researchers and clinicians to accelerate the search for new diagnostics and therapeutic targets and to streamline the study of changes in chromosomes, which is known as cytogenetics. The Saphyr system is comprised of an instrument, chip consumables, reagents and a suite of data analysis tools. Bionano provides genome analysis services to provide access to data generated by the Saphyr system for researchers who prefer not to adopt the Saphyr system in their labs. Lineagen has been providing genetic testing services to families and their healthcare providers for over nine years and has performed over 65,000 tests for those with neurodevelopmental concerns. For more information, visit www.bionanogenomics.com or www.lineagen.com.

Forward-Looking Statements

This press release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Words such as "may," "will," "expect," "plan," "anticipate," "estimate," "intend" and similar expressions (as well as other words or expressions referencing future events, conditions or circumstances) convey uncertainty of future events or outcomes and are intended to identify these forward-looking statements. Forward-looking statements include statements regarding our intentions, beliefs, projections, outlook, analyses or current expectations concerning, among other things: Saphyr's capabilities in comparison to and in conjunction with other genome analysis technologies, including in the comprehensive analysis of human genomes; the potential for Saphyr to become a central technique for studying DNA replication, DNA repair and genome instability; the potential for Saphyr-based DNA replication methods to enable the discovery of novel cancer treatments; our expectations regarding the broader adoption of Saphyr as a clinical tool to replace other diagnostic testing and genome analysis technologies; and the execution of Bionano's strategy. Each of these forward-looking statements involves risks and uncertainties. Actual results or developments may differ materially from those projected or implied in these forward-looking statements. Factors that may cause such a difference include the risks and uncertainties associated with: the impact of the COVID-19 pandemic on our business and the global economy; general market conditions; changes in the competitive landscape and the introduction of competitive products; changes in our strategic and commercial plans; our ability to obtain sufficient financing to fund our strategic plans and commercialization efforts; the ability of medical and research institutions to obtain funding to support adoption or continued use of our

technologies; the loss of key members of management and our commercial team; and the risks and uncertainties associated with our business and financial condition in general, including the risks and uncertainties described in our filings with the Securities and Exchange Commission, including, without limitation, our Annual Report on Form 10-K for the year ended December 31, 2020 and in other filings subsequently made by us with the Securities and Exchange Commission. All forward-looking statements contained in this press release speak only as of the date on which they were made and are based on management's assumptions and estimates as of such date. We do not undertake any obligation to publicly update any forward-looking statements, whether as a result of the receipt of new information, the occurrence of future events or otherwise.

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