NantHealth and NantOmics Announce Publication of Study Highlighting High Error Rates in Tumor-Only Sequencing for Cancer Treatment

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Research shows approach that includes sequencing both normal genomes and tumor genomes increases accuracy and precision

CULVER CITY, Calif.--(BUSINESS WIRE)-- NantHealth, Inc., (NASDAQ: NH), a leading next-generation, evidence-based, personalized healthcare company, and NantOmics, LLC, the leader in molecular diagnostics and a member of the NantWorks ecosystem of families, announced today joint results that show significant improvements in the accuracy of diagnosis when combining tumor-normal DNA analysis with tumor RNA analysis — as well as the risk for a higher error rate in tumor-only sequencing.

The research is included in a paper, "Comprehensive genomic transcriptomic tumor-normal gene panel analysis for enhanced precision in patients with lung cancer," published last month in the online journal *Oncotarget*.

Dr. Patrick Soon-Shiong, CEO and founder of NantHealth and NantOmics, said the publication showed the significance of combining tumor and normal DNA sequencing in diagnosis — and highlighted the precision of NantOmics' GPS Cancer test.

"Our research shows the potential peril in using tumor-only sequencing for lung cancer patients," Soon-Shiong said. "The Centers for Medicare and Medicaid Services is only reimbursing for sequencing and analysis of a 35 gene panel for lung cancer, with the patient's normal DNA explicitly excluded. Our research shows there's a serious risk of erroneous analysis in a tumor-only approach."

Oncotarget is a multidisciplinary traditional journal focused on making scientific results rapidly and widely available so that exceptional discoveries can be shared quickly.

The published results of the NantOmics and NantHealth study show the precision derived from GPS Cancer's comprehensive approach that combines tumor and normal DNA sequencing with RNA sequencing. Highlights from the study include:

- 95 percent of genomic variants identified from tumor-only sequencing originated in the germline, therefore, these variants were single nucleotide polymorphisms (SNPs) and false positive tumor somatic variants.
- After filtering based on population allele frequency to remove SNPs, the false positive rate remained as high as 48 percent.
- 29 percent of lung cancer patients had a false positive variant call in at least one of 12 genes with directly targetable drugs.
- 18 percent of true somatic variants identified from tumor and normal DNA sequencing were not expressed in RNA, showing the importance of RNA sequencing to verify gene and variant expression.

In a clinical setting, it is important to sequence the tumor and normal DNA as well as the tumor RNA as treatment decisions based on tumor-only sequencing may result in ineffective therapies while also increasing the risk of negative drug-related side effects. GPS Cancer provides a precise and comprehensive molecular profile, integrating tumor-normal sequencing of DNA with RNA sequencing. This approach overcomes the challenges faced by tumor-only DNA sequencing, equipping oncologists with insights that they can rely on to inform their personalized treatment strategies.

About NantHealth, Inc.

NantHealth, Inc., a member of the NantWorks ecosystem of companies, is a next-generation, evidence-based, personalized healthcare company enabling improved patient outcomes and more effective treatment decisions for critical illnesses. NantHealth's unique systems-based approach to personalized healthcare applies novel diagnostics tailored to the specific molecular profiles of patient tissue and integrates this molecular data in a clinical setting with large-scale, real-time biometric signal and phenotypic data to track patient outcomes and deliver precision medicine. For nearly a decade, NantHealth has developed an adaptive learning system that integrates our unique molecular profiling solution, software and hardware. Our system infrastructure collects, indexes, analyzes and interprets billions of molecular, clinical, operational and financial data points derived from novel and traditional sources to continuously improve decision-making and optimize our clinical pathways and decision algorithms over time. For more information please visit www.nanthealth.com.

About NantOmics, LLC

NantOmics, a member of the NantWorks ecosystem of companies, delivers molecular diagnostic capabilities with the intent of providing actionable intelligence and molecularly driven decision support for cancer patients and their providers at the point of care. NantOmics is the first molecular diagnostics company to pioneer an integrated approach to unearthing the genomic and proteomic variances that initiate and drive cancer, by analyzing both normal and tumor cells from the same patient and following identified variances through from DNA to RNA to protein to drug. NantOmics has a highly scalable cloud-based infrastructure capable of storing and processing thousands of genomes a day, computing genomic variances in near real-time, and correlating proteomic pathway analysis with quantitative multi-plexed protein expression analysis from the same micro-dissected tumor sample used for genomic analysis. For more information please visit www.nantomics.com and follow Dr. Soon-Shiong on Twitter @DrPatSoonShiong.

About GPS Cancer®

GPS Cancer® is a unique, comprehensive test available through NantHealth. GPS Cancer integrates tumor/normal DNA and RNA sequencing, with enhanced expression analysis and bioinformatics of complex biologic pathway systems, providing oncologists with a comprehensive molecular profile of a patient’s cancer to inform personalized treatment strategies. GPS Cancer testing is conducted in CLIA-certified and CAP-accredited laboratories. For more information, visit www.gpscancer.com.

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