

NantOmics and NantHealth Announce Results of Proprietary Machine Vision AI Software Study Demonstrating the Ability to Identify Aggressive Subtypes of Breast Cancer From Digital Pathology Images

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Study Published In Breast Cancer Research Shows How Deep-Learning Of Over 650 Breast Cancer Digital Pathology Images And Omics Data Can Be Used Together To Unlock Precise Mechanisms Of Therapy Resistance

CULVER CITY, Calif.--(BUSINESS WIRE)-- [NantOmics, LLC](#), the leader in molecular analysis, and [NantHealth, Inc.](#) (NASDAQ: NH), a next-generation, evidence-based, personalized healthcare company, announced today the publication of a peer-reviewed study in *Breast Cancer Research*, a Springer Nature journal, on a novel AI technique in breast cancer. The study reports on a novel deep-learning system of digital pathology images and omics data used together to more precisely identify mechanisms of therapy resistance.

NantOmics scientists trained a deep-neural network on diagnostic slide images from 443 breast tumors that had previously undergone PAM50 subtyping to classify patches of the tumor images into four major molecular subtypes of breast cancer (basal-like, HER2-enriched, luminal A, and luminal B). The algorithm was then validated and demonstrated the capability to establish accurate breast cancer sub-typing in 222 samples from a retained set of tumors. By focusing the neural-network's attention on cancer-rich regions in the diagnostic images, this deep-learning algorithm identifies patient biopsies that are a mixture of different molecular subtypes, a classification that is less definable from molecular pathology techniques. Patients with heterogeneous biopsies such as mixtures of basal-like and luminal disease have a different survival profile than patients with homogeneous disease, and may potentially benefit from a more tailored therapy regimen.

"Breast cancer can be subtyped into at least five distinct disease-types with very different prognoses and responses to therapy. These subtypes are characterized as clinically important, yet are typically only achievable by RNA expression profiling," Dr. Patrick Soon-Shiong, MD, Chairman and CEO of NantHealth explained. "With this AI technique we achieved 87 percent accuracy rate in detecting which patients had basal-like breast cancer (i.e., triple negative breast cancer), one of the most aggressive subtypes," he said.

"Our analysis builds on our breadth of advanced machine learning technologies to better support providers in therapeutic decision-making and to improve the capabilities of the underlying molecular analysis technology platforms that we use at NantHealth and NantOmics," said Soon-Shiong. "Through the advances of machine vision and augmented intelligence, we have developed a rapid and cost-effective deep-learning technique to unlock the rich information in readily-available diagnostic slide images to define subtypes concordant with their underlying molecular designations."

Breast Cancer Research, a Springer Nature journal, is an international, peer-reviewed online journal publishing original research, reviews, editorials and reports in breast cancer. *Breast Cancer Research* is published by BMC, an open access publisher that produces over 250 scientific journals and according to its website, is “the highest ranked breast cancer focused title in the field.”

About NantOmics

NantOmics, a member of the NantWorks ecosystem of companies, delivers molecular diagnostic and machine learning AI capabilities to provide actionable intelligence and molecularly driven decision support for patients and their providers. NantOmics is the first molecular in vitro diagnostics company to accurately identify mutations and true tumor mutation burden (TMB) from proprietary tumor-normal sequencing. The identified mutations and correlative calculation of true TMB, combined with proprietary expression analysis of immuno-oncology biomarkers and novel deep-learning derived digital pathology solutions, establish the framework for the appropriate use of targeted, chemo- and immunotherapies. NantOmics computational analysis engine, an organically grown, scalable, cloud-based infrastructure capable of processing and storing thousands of genomes per day, uses novel AI tools to combine expression analysis with near real-time genomic variance computing to generate precise N of 1 neoepitope vaccine therapies for cancer patients. For more information please visit www.nantomics.com and follow Dr. Soon-Shiong on Twitter [@DrPatSoonShiong](https://twitter.com/DrPatSoonShiong).

About NantHealth

NantHealth, a member of the NantWorks ecosystem of companies, provides leading solutions across the continuum of care for physicians, payors, patients and biopharmaceutical organizations. NantHealth enables the use of cutting-edge data and technology toward the goals of empowering clinical decision support and improving patient outcomes. NantHealth’s comprehensive product portfolio combines the latest technology in payor/provider platforms that exchange information in near-real time (NaviNet and Eviti) and molecular profiling services that combine comprehensive DNA & RNA tumor-normal profiling with pharmacogenomics analysis (GPS Cancer[®]). For more information, please visit www.nanthhealth.com or follow us on [Twitter](#), [Facebook](#) and [LinkedIn](#).

Forward-Looking Statements: NantHealth

This news release contains certain statements of a forward-looking nature relating to future events or future business performance. Forward-looking statements can be identified by the words “expects,” “anticipates,” “believes,” “intends,” “estimates,” “plans,” “will,” “outlook” and similar expressions. Forward-looking statements are based on management’s current plans, estimates, assumptions and projections, and speak only as of the date they are made. Risks and uncertainties include, but are not limited to: our ability to successfully integrate a complex learning system to address a wide range of healthcare issues; our ability to successfully amass the requisite data to achieve maximum network effects; appropriately allocating financial and human resources across a broad array of product and service offerings; raising additional capital as necessary to fund our operations; achieving significant commercial market acceptance for our sequencing and molecular analysis solutions; establish relationships with, key thought leaders or payers’ key decision makers in order to establish GPS Cancer as a standard of care for patients with cancer; our ability to grow the market for our Systems Infrastructure, and applications; successfully enhancing our Systems Infrastructure and applications to achieve market acceptance and keep pace with technological developments; customer concentration; competition; security breaches; bandwidth limitations; our ability to continue our relationship with NantOmics; our ability to obtain regulatory approvals; dependence upon senior management; the need to comply with and meet applicable laws and regulations; unexpected adverse events; clinical adoption and market acceptance of GPS Cancer; and anticipated cost savings. We undertake no obligation to update any forward-looking statement in light of new information or future events, except as otherwise required by law. Forward-looking statements involve inherent risks and uncertainties, most of which are difficult to predict and are

generally beyond our control. Actual results or outcomes may differ materially from those implied by the forward-looking statements as a result of the impact of a number of factors, many of which are discussed in more detail in our reports filed with the Securities and Exchange Commission.

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Jen Hodson
Jen@nant.com
562-397-3639

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