NanoString's GeoMx Digital Spatial Profiler Identifies Diverse Immune Responses Within COVID-19 Patients in Study Published in Nature Communications

December 9, 2020

Massachusetts General Hospital-led study uncovers that patient immune cell abundance and response are directly related to SARS-CoV-2 virus location

SEATTLE--(BUSINESS WIRE)--Dec. 9, 2020-- NanoString Technologies, Inc. (NASDAQ:NSTG), a leading provider of life science tools for discovery and translational research, today announced the publication of a new peer-reviewed study utilizing its GeoMx® Digital Spatial Profiler (DSP) platform to uncover new information in patients' responses to SARS-CoV-2 infection. The study published in Nature Communications titled, "Temporal and Spatial Heterogeneity of Host Response to SARS-CoV-2 Pulmonary Infection," revealed the spatial heterogeneity of patients' immune responses based on GeoMx DSP profiling of active SARS-CoV-2 infection in the lungs. These learnings identifying the relationship between viral location and immune response have the potential to be applied towards future therapeutic and clinical applications.

This press release features multimedia. View the full release here: https://www.businesswire.com/news/home/20201209005326/en/
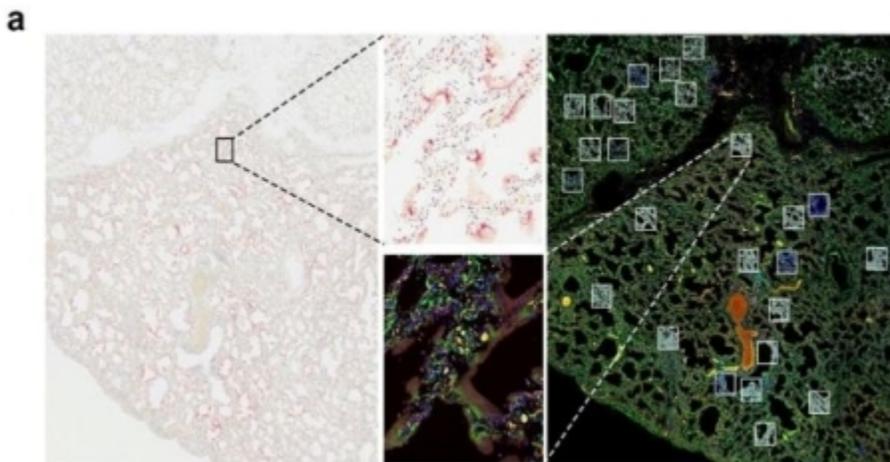

Figure A: SARS Co-V2 is visualized in infected lung tissue from 6 different tissue samples with ACD RNAscope probe (pink), and corresponding virus-positive and virus-negative ROIs were selected from a serial section for GeoMx profiling with the Cancer Transcriptome Atlas. (Graphic: Business Wire)

COVID-19 is still poorly understood within the scientific community, and outcomes vary greatly across individual patients. Research efforts have been challenged by the scarcity of patient-derived tissue samples, as well as the necessity of fixing such samples prior to analysis to reduce the risk of viral transmission. However, the ability of GeoMx DSP to perform high-plex, spatial profiling of formalin-fixed paraffin-embedded (FFPE) samples enables researchers to gather more information from each precious sample and rapidly evaluate the body's response to infection.

"We now have the ability to better understand the diversity of SARS-CoV-2 infections in patient lung samples using the unprecedented spatial transcriptomic and proteomic analysis that the GeoMx Digital Spatial Profiler provides," said David Ting, Associate Clinical Director for Innovation at the Mass General Cancer Center and Assistant Professor of Medicine at Harvard Medical School. "We hope these findings, along with continued spatial analysis of infected tissue samples, will inform the design of prospective interventional trials."

In this study, FFPE autopsy samples from patients with SARS-CoV-2 infection were analyzed with the GeoMx DSP, using the >1,800+ plex GeoMx COVID-19 Immune Response Atlas and a 79-plex GeoMx protein assay. GeoMx DSP revealed high intra- and inter-patient heterogeneity in the abundance and localization of immune markers. A critical step prior to quantitative profiling with GeoMX DSP is to determine the cells that contain the SAR-CoV-2 virus. Those cells are grouped into regions of interest with high and low viral loads using RNAscope SARs-CoV-2 probes from Advanced Cell Diagnostics (ACD), a Bio-techne brand. Immune cell types were classified in each region of interest, uncovering spatial relationships between the virus location and immune cell abundance, which may have therapeutic implications.

"This study detected differences in immunoregulatory markers that were not identified using traditional immunohistochemical staining and whole slide analysis, illustrating the importance of high-plex spatial analysis," said Joe Beechem, chief scientific officer and SVP of R&D for NanoString. "The ability of GeoMx DSP to perform robust, highly sensitive spatial profiling of FFPE samples was critical to enable researchers to gather more information from clinically relevant samples."

Data from this study has been uploaded to NCBI GEO and is accessible to the public for continued analysis. To learn more about the ways that NanoString's products enable COVID-19 research, and to access the GeoMx images and data from this study, please visit www.nanostring.com/COVID19.

To learn more about NanoString's GeoMx Digital Spatial Profiler, please visit https://www.nanostring.com/products/geomx-digital-spatial-profiler/geomx-dsp.

About NanoString Technologies, Inc.

NanoString Technologies is a leading provider of life science tools for discovery and translational research. The company's nCounter® Analysis System is used in life sciences research and has been cited in more than 3,800 peer-reviewed publications. The nCounter Analysis System offers a

cost-effective way to easily profile the expression of hundreds of genes, proteins, miRNAs, or copy number variations, simultaneously with high sensitivity and precision, facilitating a wide variety of basic research and translational medicine applications, including biomarker discovery and validation. The company's GeoMx® Digital Spatial Profiler enables highly-multiplexed spatial profiling of RNA and protein targets in a variety of sample types, including FFPE tissue sections.

For more information, please visit www.nanostring.com.

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