Digital Spatial Profiling of COVID-19 Tissue Samples

Rapidly perform high-plex spatial analyses of the host response in FFPE or fresh frozen tissue using the GeoMx® Digital Spatial Profiler (DSP). NanoString's GeoMx DSP platform enables high-plex protein and RNA experiments into key areas of biology such as molecular response, cellular (immune) response, tissue damage, and drivers of individual susceptibility to severe forms of disease.

- Profile over 1,850 RNA targets, including **COVID-19 receptors** and **proteases**, as well as **viral targets** with the **GeoMx COVID-19 Immune Response Atlas**
- Run the **5-antibody custom COVID-19 module** with the GeoMx Immune Cell Profiling Core and profile up to 96 protein targets simultaneously
- Study **FFPE** or **fresh frozen** tissue samples

RNA

The GeoMx® COVID-19 Immune Response Atlas, a ~1,850-plex RNA assay, enables spatial studies of the SARS-CoV-2 virus and host response. RNA targets are profiled simultaneously using the GeoMx DSP and an Illumina next-generation sequencer (NGS) for readout.

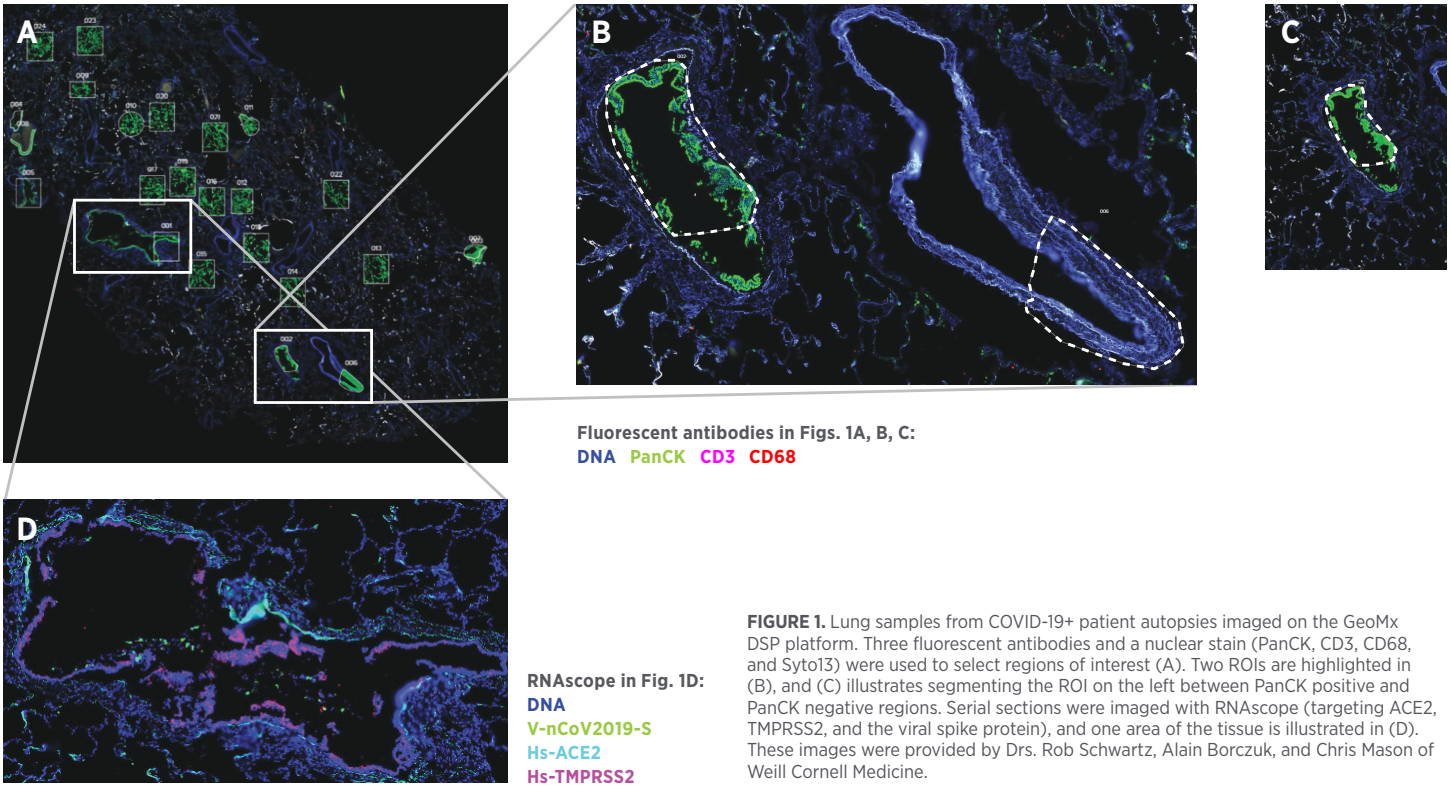
Use RNAscope™ probes alongside GeoMx RNA probes to identify regions of interest (**FIGURE 1**).

ACD a biotechne brand

SARS-CoV-2	IL-6
ACE-2	TNFα
TMPRSS2	IFNγ

GeoMx® RNA targets include:

- COVID receptors & proteases
- Pulmonary alveolar type I and II markers
- Lung biology markers
- Viral response markers
- SARS-CoV-2 probes



Fluorescent antibodies in Figs. 1A, B, C:
DNA PanCK CD3 CD68

RNAscope in Fig. 1D:
DNA
V-nCoV2019-S
Hs-ACE2
Hs-TMPRSS2

FIGURE 1. Lung samples from COVID-19+ patient autopsies imaged on the GeoMx DSP platform. Three fluorescent antibodies and a nuclear stain (PanCK, CD3, CD68, and Syto13) were used to select regions of interest (A). Two ROIs are highlighted in (B), and (C) illustrates segmenting the ROI on the left between PanCK positive and PanCK negative regions. Serial sections were imaged with RNAscope (targeting ACE2, TMPRSS2, and the viral spike protein), and one area of the tissue is illustrated in (D). These images were provided by Drs. Rob Schwartz, Alain Borczuk, and Chris Mason of Weill Cornell Medicine.

PROTEIN

Assess the spatial proteomic profile of SARS-CoV-2 infected samples with up to 96 antibodies including a 5-antibody custom protein module developed in partnership with Abcam. Run the COVID-19 GeoMx-formatted Antibody Panel from Abcam with the 20-plex GeoMx Immune Cell Profiling Core (plus controls) and up to six ~10-plex modules, including:

Immune Cell Profiling Core	Key immune targets and markers of T cells, B cells, macrophages, and more
Immune Activation Status Module	Additional T cell and T cell activation markers
Immune Cell Typing Module	More cell type markers including dendritic cells and Tregs
Cell Death Module	Protein mediators of immunogenic and programmed cell death

COVID-19 GeoMx-formatted Antibody Panel targets:

- ACE2
- TMPRSS2
- Cathepsin L/V/K/H
- DDX5
- SARS-CoV-2 Spike

abcam

Available for purchase from Abcam abcam.com/ab273594, and for use through NanoString's Technology Access Program.

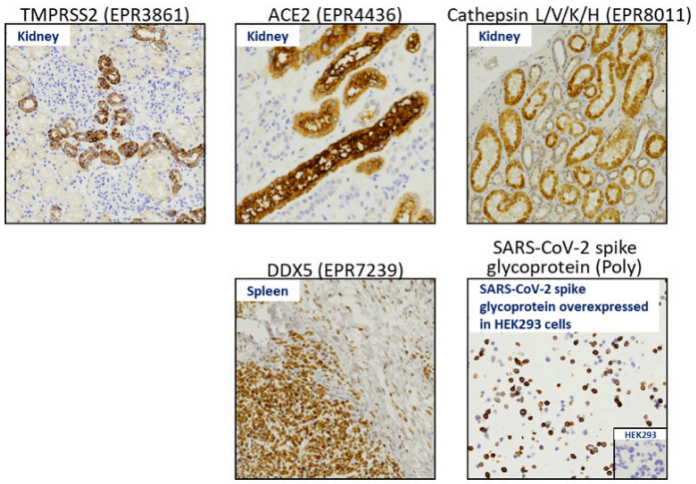


FIGURE 2. Post-conjugation IHC of the 5 antibodies in the COVID-19 custom antibody module developed with Abcam. In addition to a pre- and post-conjugation IHC screen, antibodies were tested in 30+ tissues in a tissue microarray and the SARS-CoV-2 spike antibody was tested in 3 viral overexpressing cell lines.

Use up to 3 fluorescent antibodies plus a nuclear stain to identify regions of interest. NanoString can recommend commercially-available markers for COVID-19 research, including:

- Pneumocyte type II (SFTPC)
- Nasal Epithelium (TNFS10)
- Immune Response Marker (CD38, CXCR3)
- Viral Spike (Figure 3) and Nucleocapsid Protein

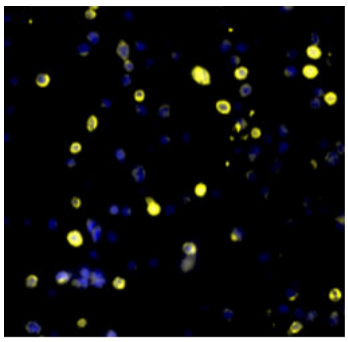


FIGURE 3. SARS-CoV-2 spike protein morphology marker tested in HEK294/SARS-CoV-2 Spike Cells on the GeoMx DSP.

For more information, please visit nanostring.com/GeoMxDSP

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