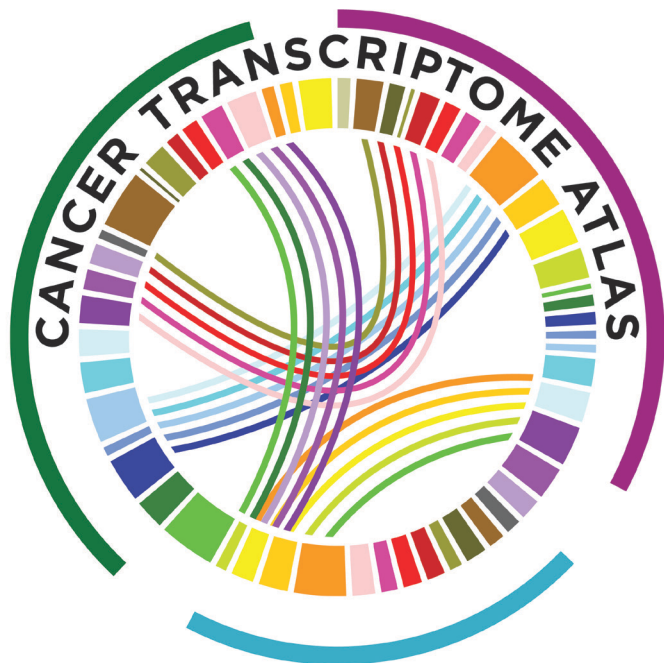




## GeoMx<sup>®</sup> Cancer Transcriptome Atlas

Profile over 1,800 RNA targets simultaneously with spatial resolution in any region of interest from a single tissue section using the GeoMx Digital Spatial Profiler (DSP). The GeoMx Cancer Transcriptome Atlas (CTA) is designed for comprehensive profiling of the tumor, tumor microenvironment, and tumor immune status.



### Product Highlights

- Comprehensive RNA content designed for cancer biology research
- Expansive coverage of the immune response, tumor microenvironment, and tumor biology
- Includes clinically relevant gene sets from BC 360 and IO 360 such as the Tumor Inflammation Signature and PAM50
- Over 100 pathways to explore all aspects of cancer
- Compatible with RNAscope™ and antibody morphology markers
- Supplement with up to 60 additional targets of interest
- For use with Illumina next-generation sequencer (NGS) readout
- Utilize the GeoMx Data Center for interactive analysis

### GeoMx<sup>®</sup> Cancer Transcriptome Atlas Design

Designed to profile over 1,800 RNA targets simultaneously with spatial resolution, the Cancer Transcriptome Atlas (CTA) contains targets for broad cell profiling and includes necessary controls for all GeoMx DSP experiments. The CTA covers 112 pathways critical to immune response, tumor biology, and the microenvironment. GeoMx RNA assays contain in situ hybridization (ISH) probes conjugated to unique DNA indexing-oligonucleotides via a UV-photocleavable linker. After selecting regions of interest (ROI) on GeoMx DSP, the DNA oligonucleotides are UV cleaved and then sequenced on an Illumina sequencer. DNA oligonucleotide sequences contain ROI indices mapping them back to their tissue location, an RNA target identification sequence matching them to their ISH probes, and a unique molecular identifier (UMI) to deduplicate reads. Sequenced oligonucleotides are processed, then imported back into the GeoMx Data Center platform for integration with the slide images and ROI selections for spatially-resolved RNA expression.

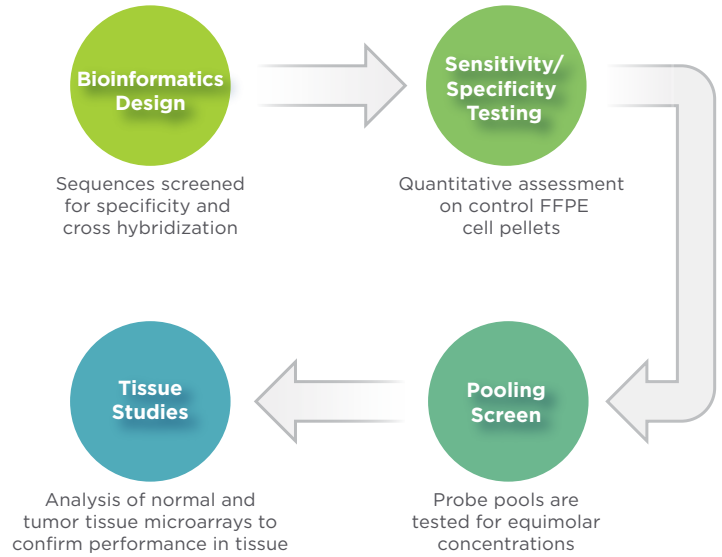
## Curated Content for Cancer Biology

The GeoMx CTA is designed to profile all aspects of tumor and tumor microenvironment biology. Accompanying Morphology Marker Kits are available for tissue visualization and ROI selection.

Adaptive Immunity	#Genes	Innate Immunity	#Genes
T cells B cells	130	Complement System	49
TCR & BCR Signaling	194	Dendritic Cells	19
Cancer Antigens	18	DNA & RNA Sensing	107
MHC Class I & II Antigen Presentation	86	Glycan Sensing	63
T-cell Checkpoints	27	Host Defense Peptides	22
TH1, TH2, TH9, Th17, and Treg Differentiation	107	Inflammasomes	11
		Myeloid Inflammation	96
		Neutrophil Degranulation	124
		NK Activity	94
		NLR Signaling	88
		RAGE Signaling	8
		TLR Signaling	135
Immune Response	#Genes	Signaling Pathways	#Genes
Chemokine Signaling	121	AMPK Signaling	44
Cytotoxicity	6	Androgen Signaling	32
IL-1, IL-2, IL-6 & IL-17 Signaling	168	EGFR Signaling	17
Immune Exhaustion	20	ERBB2 Signaling	21
Interferon Response Genes	25	Estrogen Signaling	84
Lymphocyte Regulation & Trafficking	202	FGFR Signaling	40
NF-κB Signaling	114	FoxO Signaling	79
Other Interleukin Signaling	173	GPCR Signaling	177
Prostaglandin Inflammation	4	Hedgehog Signaling	45
TNF Signaling	96	HIF1 Signaling	68
Type I, II, & III Interferon Signaling	103	Insulin Signaling	81
		JAK-STAT Signaling	118
		MAPK Signaling	261
		MET Signaling	34
		mTOR Signaling	76
		Myc	26
		NO Signaling	10
		Notch Signaling	74
		p53 Signaling	76
		PDGF Signaling	30
		PI3K-Akt Signaling	242
		PPAR Signaling	15
		Purinergic Signaling	3
		Retinoic Acid Signaling	5
		TGF-beta Signaling	69
		VEGF Signaling	69
		Wnt Signaling	124
Cell Function	#Genes	Physiology & Disease	#Genes
Apoptosis	121	Angiotensin System	5
Autophagy	62	Circadian Clock	22
Cell Adhesion & Motility	139	Drug Resistance	3
Cell Cycle	167	Glioma	60
Cilium Assembly	10	Leukemia	93
Differentiation	225	Matrix Remodeling and Metastasis	52
DNA Damage Repair	90	Melanoma	70
EMT	98	Neuroendocrine Function	8
Endocytosis	57	Prostate Cancer	92
Epigenetic Modification	166		
Immortality & Stemness	33		
Ion Transport	37		
Lysosome	14		
Oxidative Stress	151		
Phagocytosis	105		
Proteotoxic Stress	22		
RNA Processing	35		
Senescence	128		
Metabolism	#Genes	Tissue Compartment	#Genes
Amino Acid Synthesis & Transport	55	Tumor Biology	1454
Arginine & Glutamine Metabolism	51	Immune Response	1481
Fatty Acid Oxidation & Synthesis	15	Microenvironment	978
Glycolysis & Glucose Transport	29		
Glycosylation	12		
IDH1/2	10		
Lipid Metabolism	78		
Mitochondrial Metabolism / TCA	52		
Nucleotide Synthesis	10		
Pentose Phosphate	7		
Tryptophan & Kynurenine Metabolism	4		
Vitamin & Cofactor Metabolism	28		

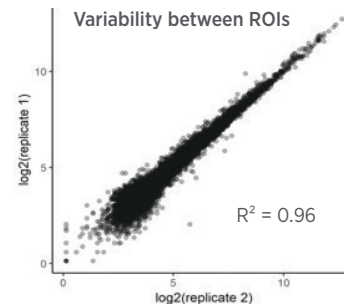
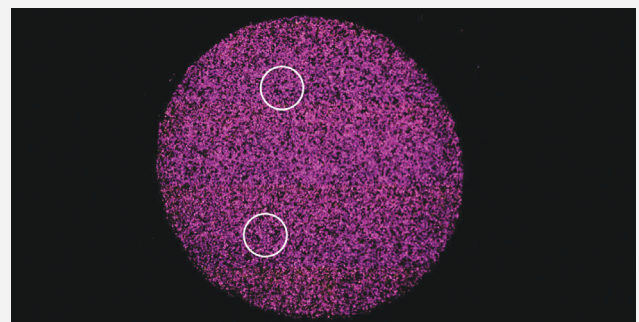
## Validated Assays Ready for Use

All GeoMx RNA assays undergo extensive validation to ensure high quality GeoMx DSP data.



## Spatial RNA Profiling with High Reproducibility

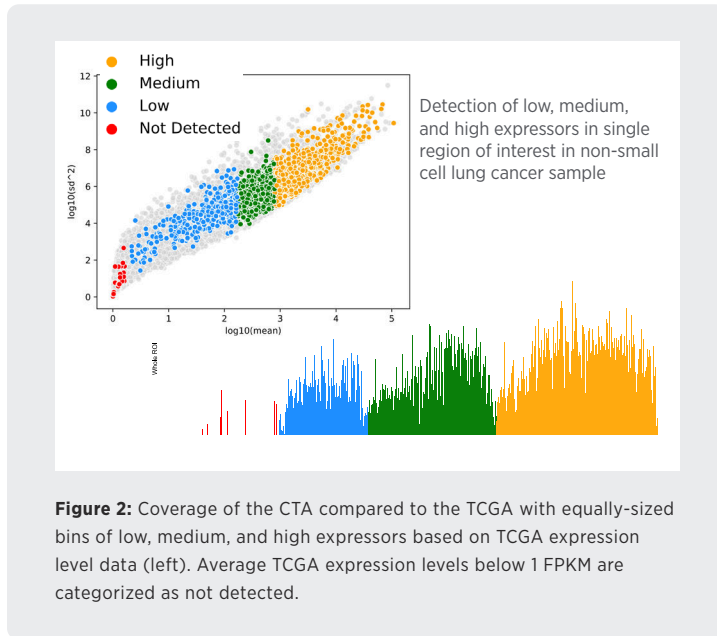
RNA detection shows high reproducibility between regions of interest selected from 6 cell lines within a cell pellet array (FIGURE 1).



**Figure 1:** High reproducibility between two 300 μm ROIs selected in 6 different cell lines. An example cell pellet is pictured above with ROIs selected.

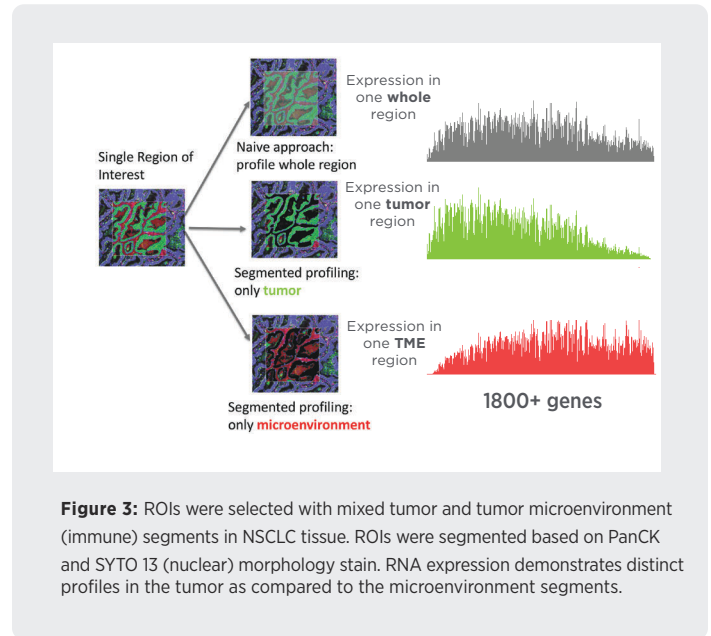
## High Sensitivity Across All Targets

The GeoMx CTA detects high, medium, and low expressing genes with broad coverage of the genes in The Cancer Genome Atlas (TCGA)<sup>2</sup>.



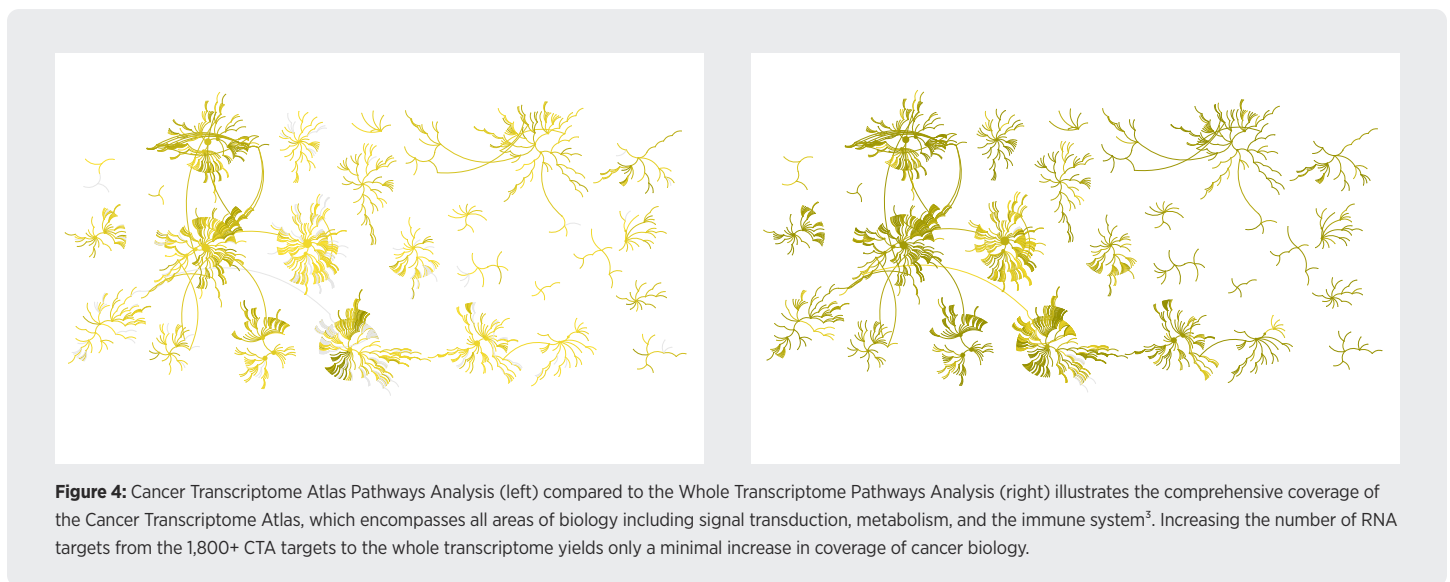
## Reveal Tissue Heterogeneity

Segmentation analysis of a region of interest (ROI) from a non-small cell lung cancer (NSCLC) sample demonstrates distinct RNA expression profiles in the tumor and tumor microenvironment segments, which would be lost if profiling the ROI as a whole (FIGURE 3).



## Comprehensive Coverage for Cancer Biology

Designed for cancer biology research, the Cancer Transcriptome Atlas provides complete coverage of tumor biology, the microenvironment, and the immune response, without sequencing unnecessary targets.



## GeoMx® Data Center

Unique GeoMx Data Center software uniquely combines whole tissue visualization at single cell resolution with advanced ROI selection to enable comprehensive spatial profiling of tissue sections. The fully integrated workflow tracks image data to corresponding profiling data, allowing users to easily go from data collection to data analysis and to interact with either dataset in real time. The data analysis module assesses the quality of the raw data and provides a number of options to normalize data sets. Moreover, a variety of data visualization formats are enabled to export publication-quality figures. Visualization plots include: heatmap, cluster, bar graph, box plot, scatter plot, line/trend plot, strip plot, volcano plot, and PCA.

To view the RNA probe list visit: [nanosttring.com/geomxassays](https://nanosttring.com/geomxassays)

## Ordering Information

GeoMx Cancer Transcriptome Atlas			
Product	Product Description	Quantity	Catalog Number
GeoMx Cancer Transcriptome Atlas <i>Human RNA for Illumina Systems</i>	RNA panel including over 1,800 targets plus controls for human immune response, tumor biology, and microenvironment. Includes RNA probes for Illumina NGS readout.	4 slides	GMX-RNA-NGS-CTA-4
GeoMx Morphology Kits			
Product	Product Description	Quantity	Catalog Number
GeoMx Solid Tumor TME Morphology Kit <i>Human RNA Compatible</i>	Morphology kit for visualization of human solid tumors and the tumor microenvironment. For use with RNA assays. Includes fluorescent antibodies against PanCK, CD45, and a nuclear stain.	12 slides	GMX-RNA-MORPH-HST-12
GeoMx Melanoma TME Morphology Kit <i>Human RNA Compatible</i>	Morphology kit for visualization of human melanoma and the tumor microenvironment. For use with RNA assays. Includes fluorescent antibodies against S100B/Pmel17, CD45, and a nuclear stain.	12 slides	GMX-RNA-MORPH-HMEL-12
Additional Assay Reagents			
Product	Product Description	Quantity	Catalog Number
GeoMx Seq Code Pack <i>Compatible with Illumina Systems</i>	NGS readout reagents for GeoMx DSP RNA and protein analysis. Includes two Seq Code primer plates (choice of A&B, C&D, E&F, or G&H) and two universal enzyme master mixes.	192 AOI	GMX-NGS-SEQ-[XX]
GeoMx RNA Slide Prep Kit for FFPE	Sample prep reagents for GeoMx DSP RNA analysis. Includes Buffer W, Buffer S, and Buffer R.	12 slides	GMX-PREP-RNA-FFPE-12
GeoMx DSP Collection Plate	Barcoded collection plates for use on the GeoMx DSP. Required for AOI tracking. Kit includes 12 plates covering 1,152 AOI.	1 Pack	GMX-DSP-COLL-PLT-4
GeoMx DSP Instrument Buffer Kit	Buffer kit for the GeoMx DSP. Includes Buffer S and Buffer H. Sufficient for ~48 samples with ~18 AOI each. Volume requirements may vary based on experimental design.	1 Kit	GMX-DSP-BUFF-KIT

## References

- Ayers, Mark, et al. IFN- $\gamma$ -related mRNA profile predicts clinical response to PD-1 blockade. *Journal of Clinical Investigation*. 127.8 (2017).
- National Cancer Institute: The Cancer Genome Atlas Program. [cancer.gov/tcga](https://cancer.gov/tcga)
- Pathway Analysis figures from Reactome, Copyright 2020 Reactome, License CC BY 4.0. Image cropped from original.

For more information, please visit [nanosttring.com/GeoMxDSP](https://nanosttring.com/GeoMxDSP)

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