#5637 Single-Cell Spatial Transcriptome Profiling Using 6,000-Plex Spatial Molecular Imaging on FFPE Tissue

Joseph Beechem[1], Shanshan He[1], Michael Patrick[1], David Kroeppler[1], Mark Gregory[1], Yongfang Lu[1], Jason Reeves[1], Patrick Danaher[1], Erin Piazza[1], Zachary Reitz[1], Michael Rhodes[1], Arya Bahrami[1], Haiyan Zhai[1]

[1]NanoString® Technologies, Seattle WA.

nanoString
NanoString Technologies
530 Fairview Avenue North, Seattle, WA
98109

Summary

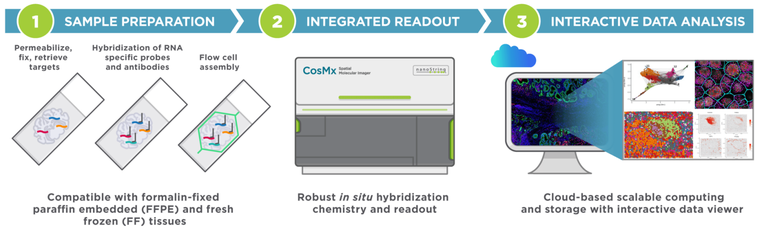
The CosMx™ Spatial Molecular Imager (SMI) technology has demonstrated the highest commercially available 1,000-plex RNA panel. Here we present the "next generation panel", which detects more than 6,000 unique targets simultaneously in intact FFPE tissue.

Key Highlights:

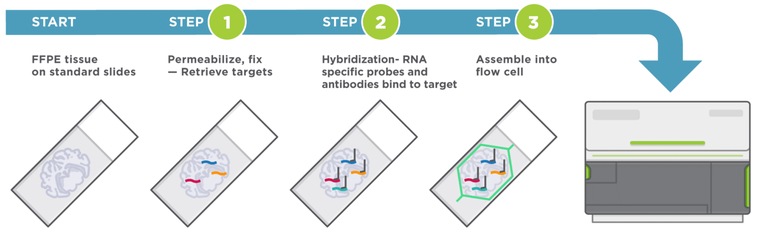
- **CosMx assay enables efficient single-cell spatial transcriptome profiling in intact FFPE tissue with automatable sample preparation**
- **CosMx 6,000-plex profiles thousands of transcripts simultaneously with high sensitivity and specificity, coupled with protein co-detection on single slides, enabling unlimited biological discovery including cell typing and pathway analysis in space**

CosMx for Single-Cell Transcriptome Imaging

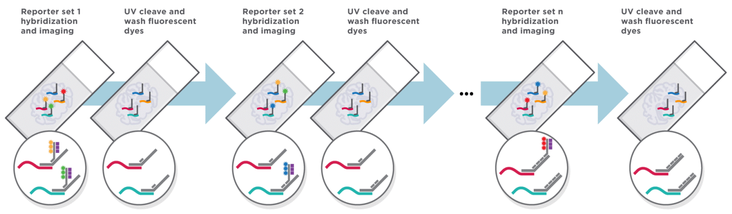
CosMx SMI delivers a comprehensive package which includes validated reagents, instrument, and data analysis software for seamless sample-to-result.



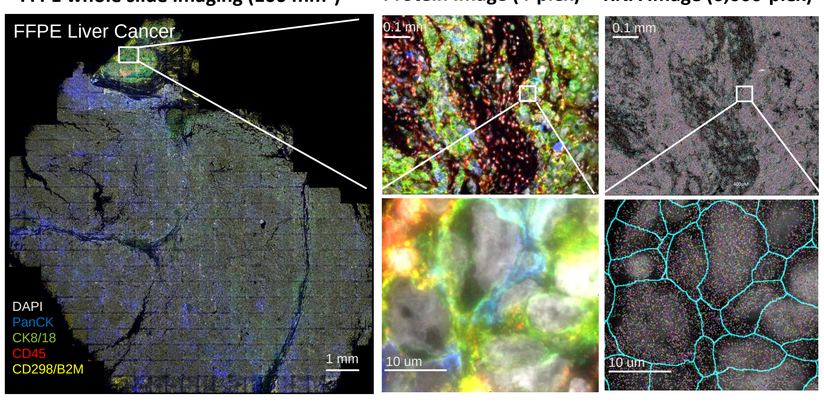
Automatable sample preparation, compatible with FFPE and Fresh Frozen tissue



Automated Cyclic Chemistry for direct detection of transcripts in intact tissue



Co-detection of High-plex RNA and Protein on Single Slide



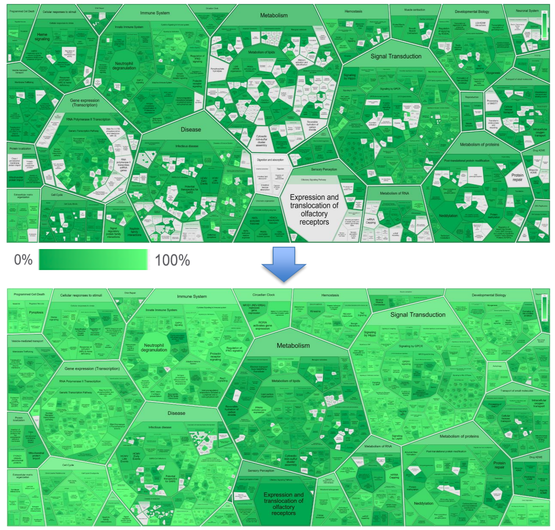
CosMx 6,000-Plex RNA Panel

CosMx SMI 6,000-plex panel is the highest-plex RNA panel for Spatial Transcriptome Profiling at single-cell and subcellular resolution

1,000-plex RNA Panel

Expansion to 6,000-plex Panel provides broadest coverage available on biological areas with special emphasis on oncology, immunology, and neuroscience

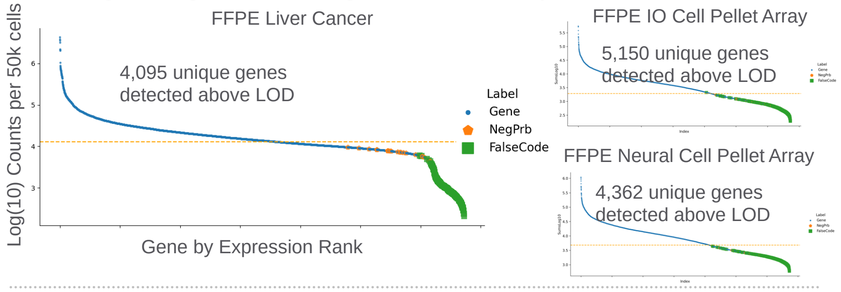
6,000-plex RNA Panel



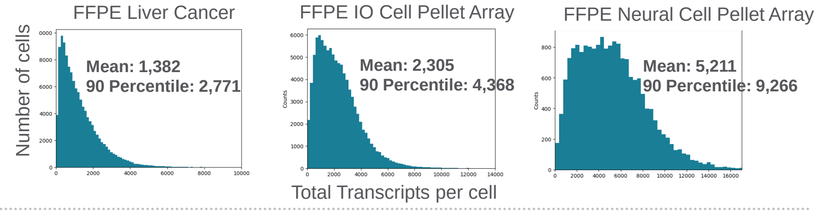
World-class Performance of CosMx 6,000-plex RNA assay

Performance Summary of CosMx 6,000-plex RNA panel			
Tissue type	FFPE IO Cell Pallet Array (37 IO cell lines)	FFPE Cell Pallet Array (10 Neural cell lines)	FFPE Human Hepatocellular Carcinoma
DV200 (%)	95.20	96.20	68.07
% cells pass QC	99.5%	99.5%	99.3%
Mean total transcripts/cell	**2,305**	**5,211**	**1,382**
Unique genes detected per slide	**5,150**	**4,362**	**4,095**
Unique genes per cell (mean)	**1,221**	**2,126**	**707**

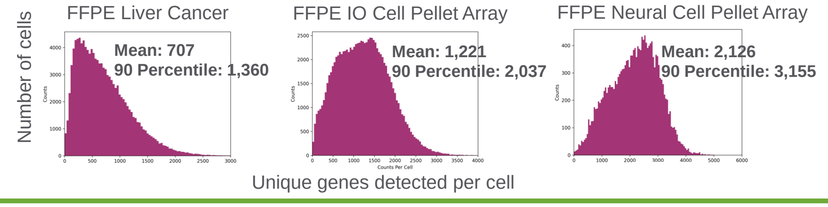
Detecting > 4,000 genes above background simultaneously



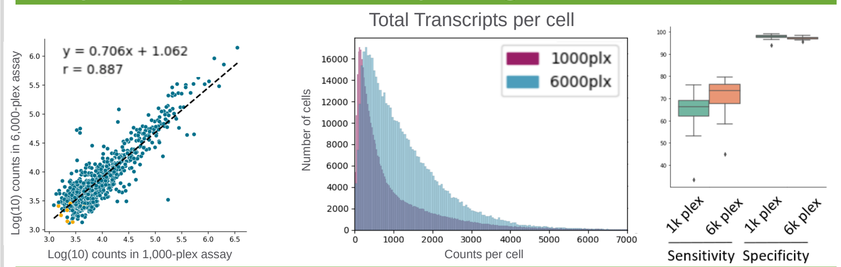
Detecting thousands of transcripts per cell



Detecting thousands of unique genes per cell

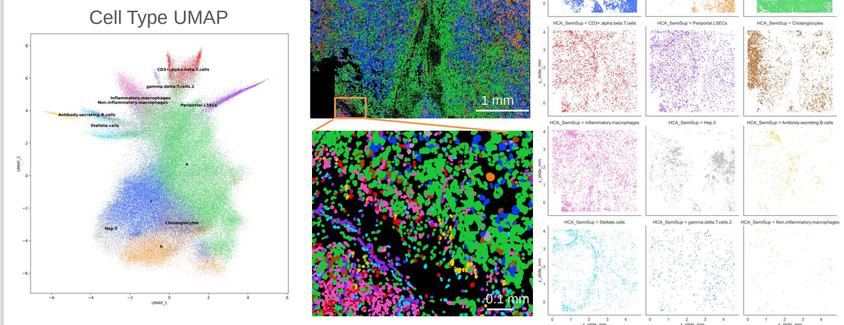


Assay Quality Remains When Expanding From 1,000 to 6,000 Plex

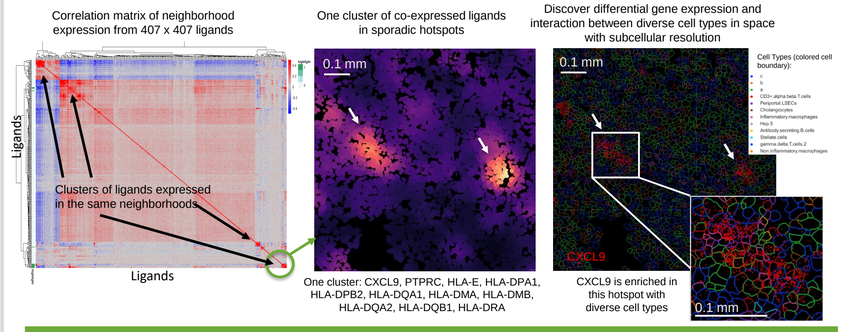


Biological Discovery Using 6,000-Plex RNA Panel

Cell typing and spatial projection at single-cell resolution in FFPE liver cancer

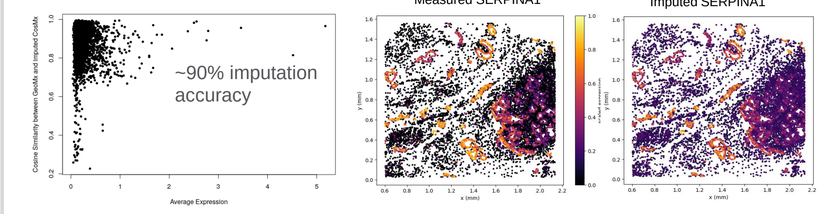


Discovery of spatially co-expressed ligands in diverse types of cells in FFPE liver cancer



Spatial Imputation of Whole Transcriptome

CosMx 6,000-plex panel allows spatial imputation of the whole transcriptome at high accuracy (example shown in PDAC)



Conclusion

CosMx 6,000-plex panel enables spatial measurements of 6,000 gene simultaneously, with protein co-detection and large viewing area on single archived FFPE tissue with high efficiency and low noise. This high-plex data allows imputation of the entire spatial transcriptome at very low imputation ratios (2 imputed genes for every measured gene). CosMx high-plex technology has the ability to transform our understanding of every major area of biology and facilitate the next level of cancer research.