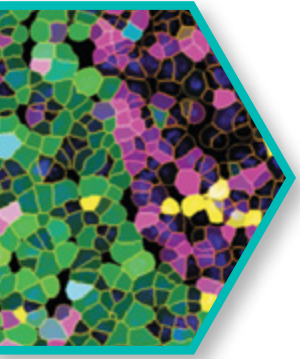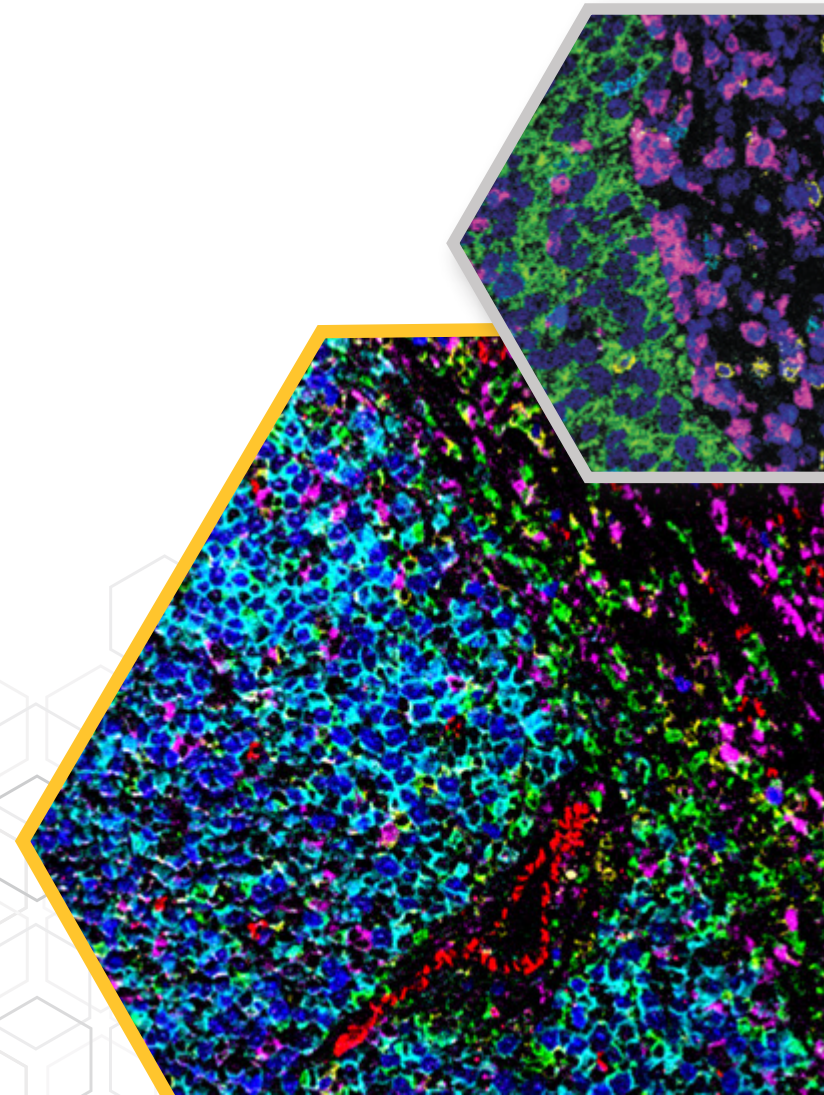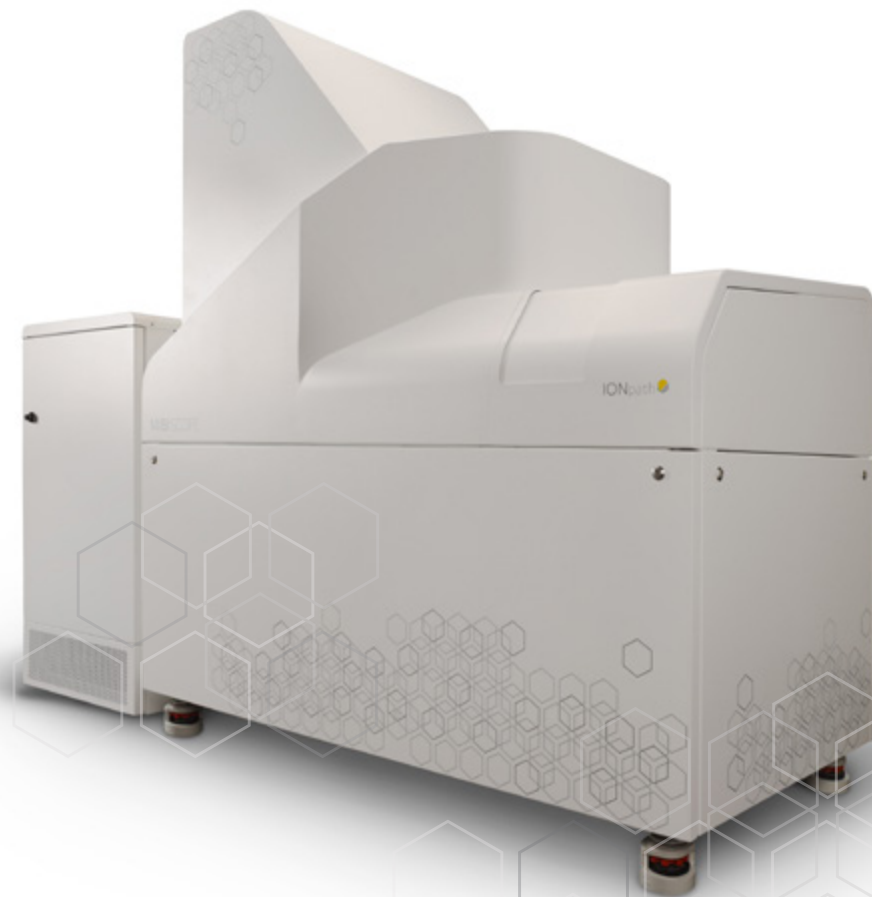# MIBIscope™

WITH MULTIPLEXED ION BEAM IMAGING (MIBI™) TECHNOLOGY
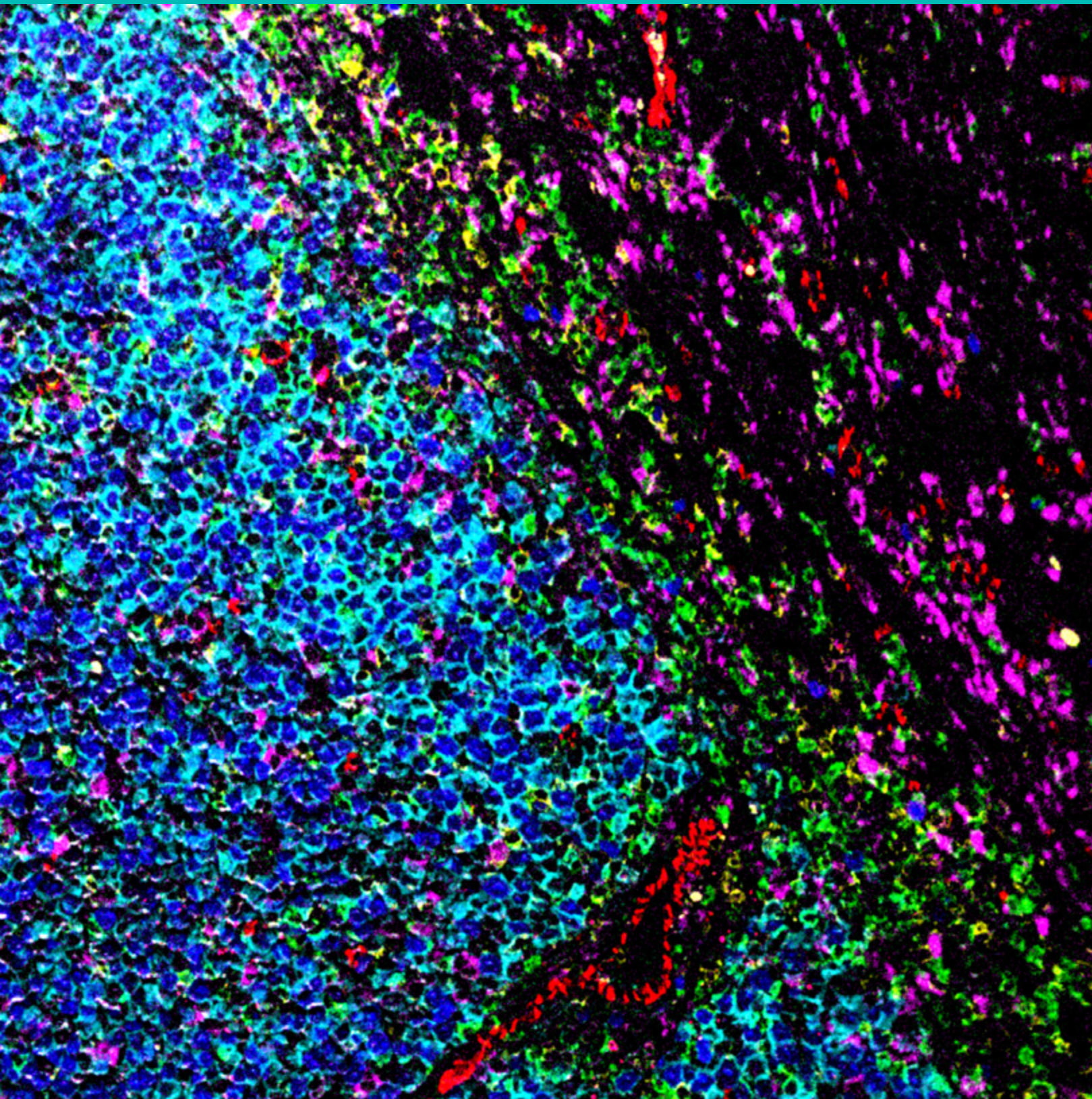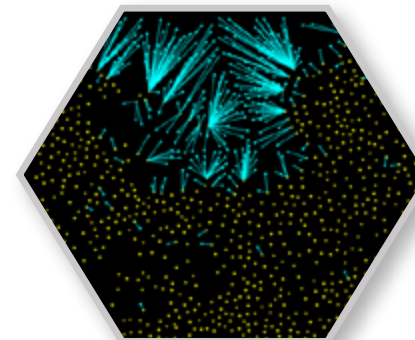
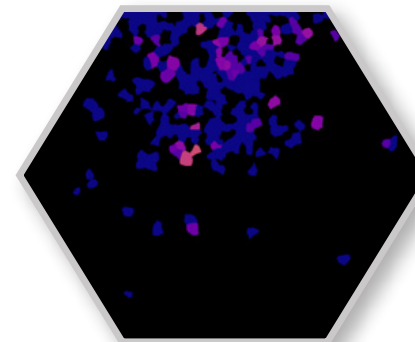## TRANSFORMING
MULTIPLEXED TISSUE IMAGING
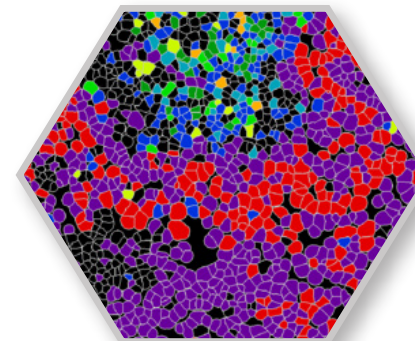
IONpath

MIBIscope
A REVOLUTIONARY TECHNOLOGY
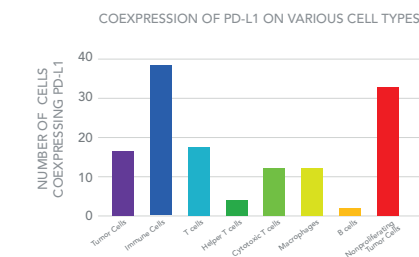
FOR ANALYSIS OF
THE TUMOR MICROENVIRONMENT

CELL CLASSIFICATION
Comprehensively phenotype immune infiltrate

COEXPRESSION OF PD-L1 ON VARIOUS CELL TYPES

PROTEIN EXPRESSION
Quantify protein expression
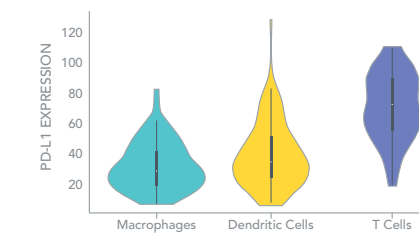
SPATIAL ANALYSIS
Profile tissue architecture
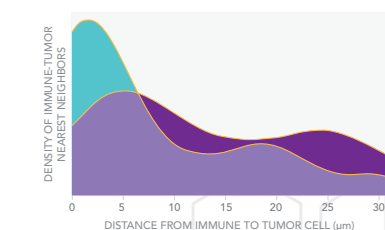
VISUALIZE 40+ MARKERS IN A SINGLE IMAGE
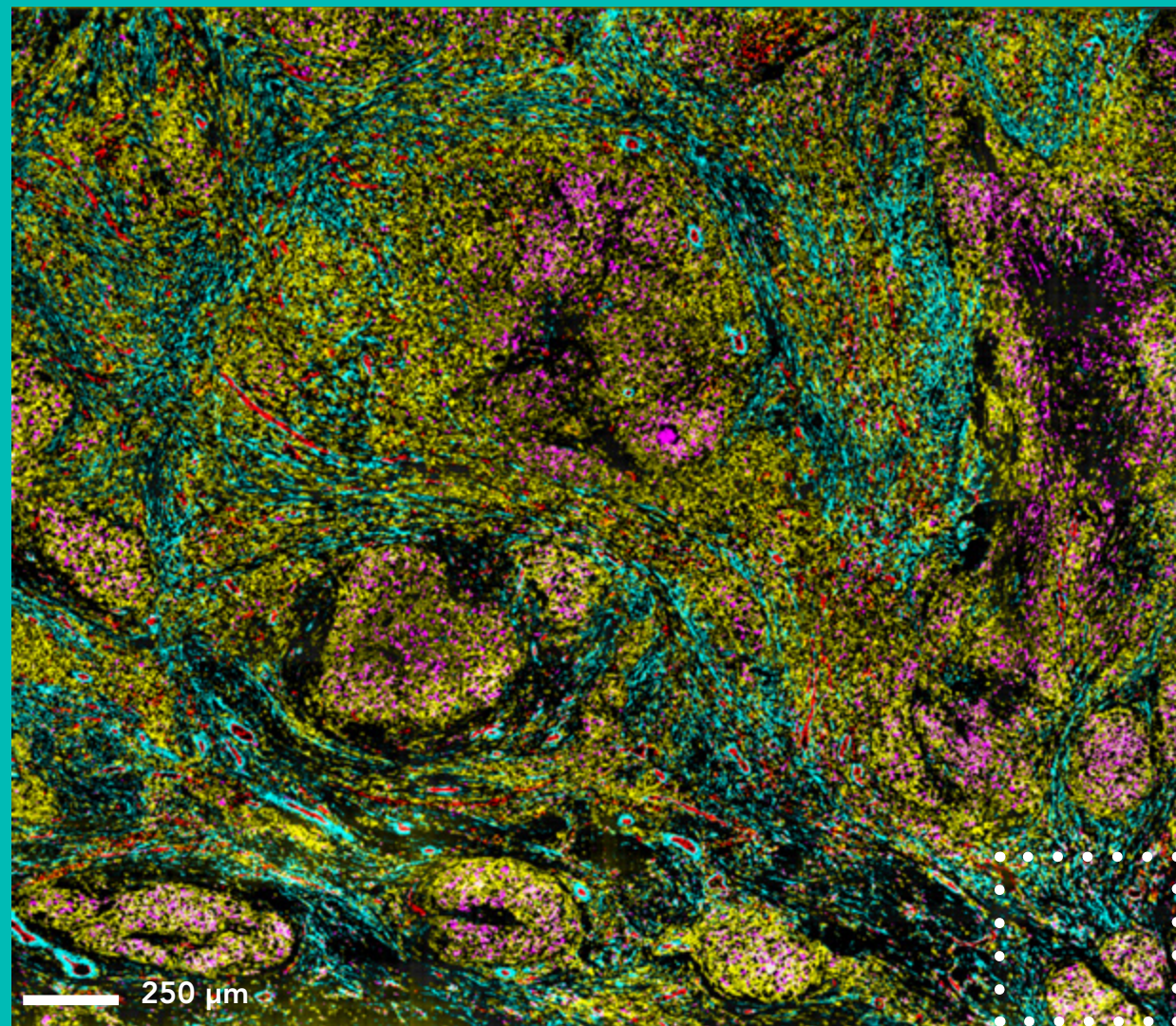
Lung granuloma (3x3 mm²)

250 µm

● CD45
● CD31
○ SMA
● CD68

CD14	ARGINASE-1	CD4	CD8	CD20	HO-1	CHYMASE
VIMENTIN	CD11c	MHC I	MHC II	CD31	iNOS	HH3
H3K9ac	FOXP3	COL1	CD206	Na/K ATPase	CD163	CD3
panCK	CD45	Ki67	CD209	SMA	gdTCR	MPO
ECAD	CD162	CD68	CD103	CD36	CD116	CARBON

50 µm
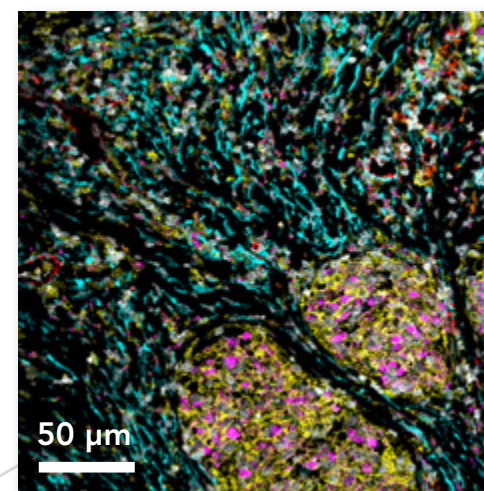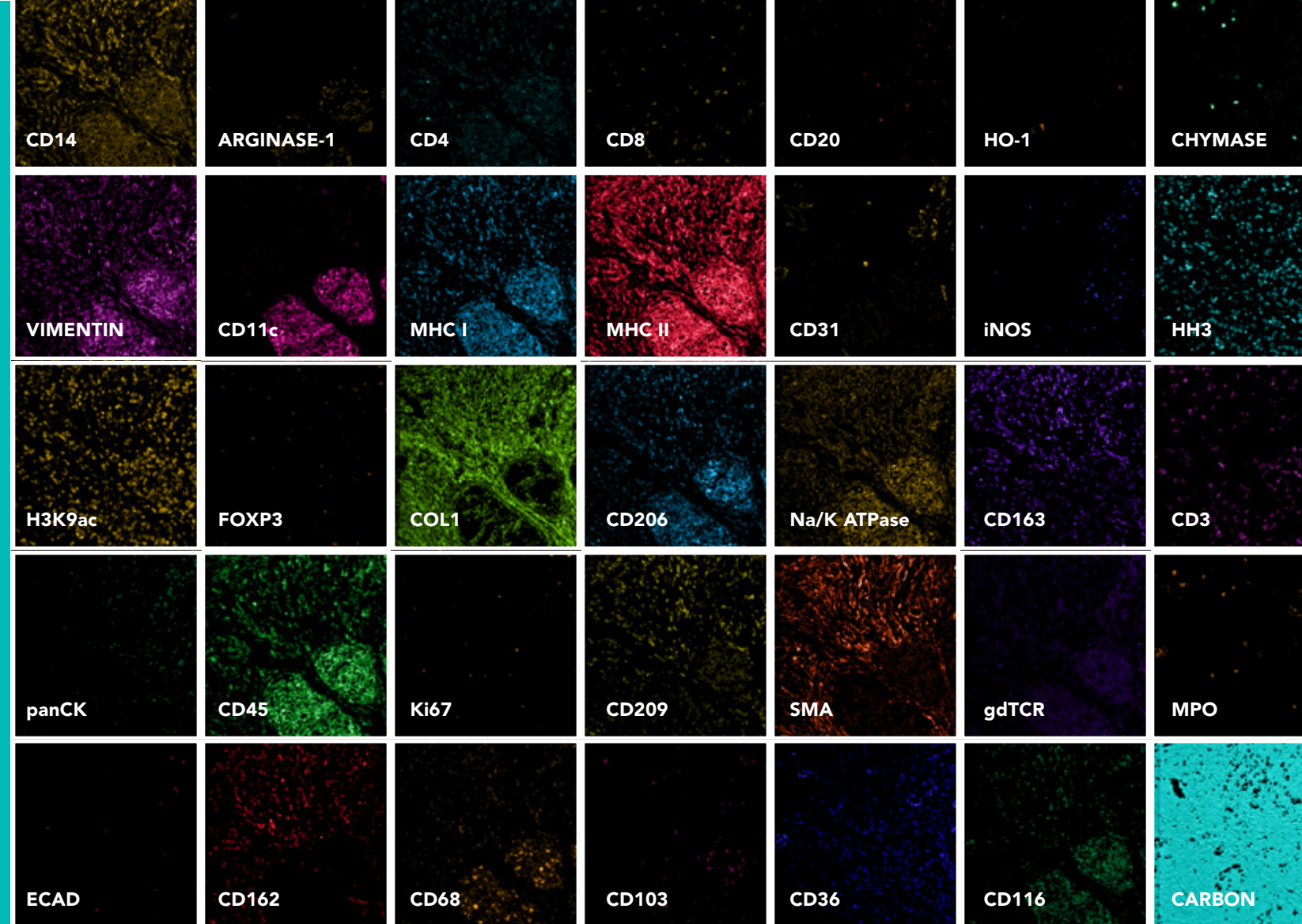
CD45 CD31 SMA CD68 HH3
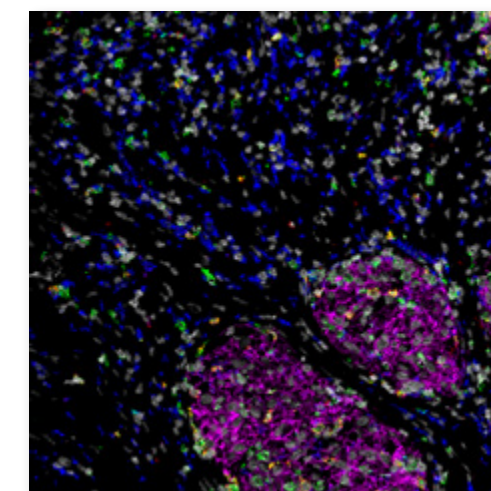
CD163 CD11c CD8 CD3 HH3

HIGH RESOLUTION

Achieve confocal resolution

50µm
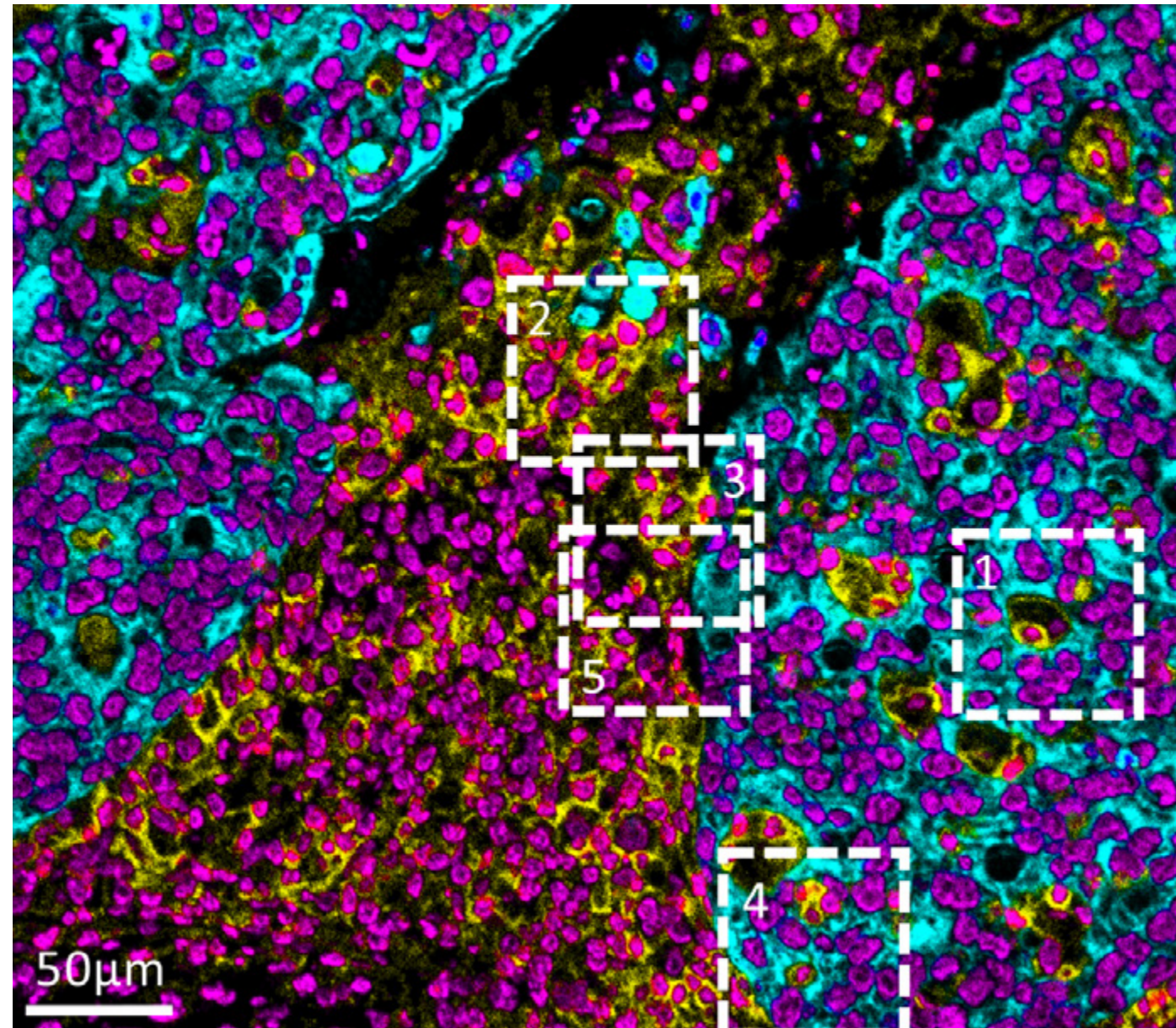
- ● Cytokeratin
- ● CD45
- ● DNA
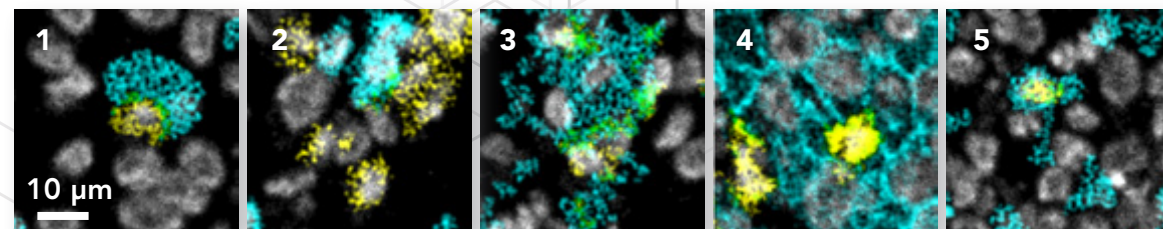
1	2	3	4	5
● IDO	● CD8	● PD-L1	● β-Catenin	● CD4
● CD56	● PD-1	● PD-1	● CD20	● FOXP3
○ DNA	○ DNA	○ DNA	○ DNA	○ DNA

10 µm

HIGH THROUGHPUT

Image up to 90 800x800 µm² ROIs per day

HIGH SENSITIVITY

DETECTION LIMIT

Ab COPY NUMBER

20

15

10

5

0

Y In La Ce Pr Nd Sm Eu Tb Gd Dy Ho Er Tm Lu Yb
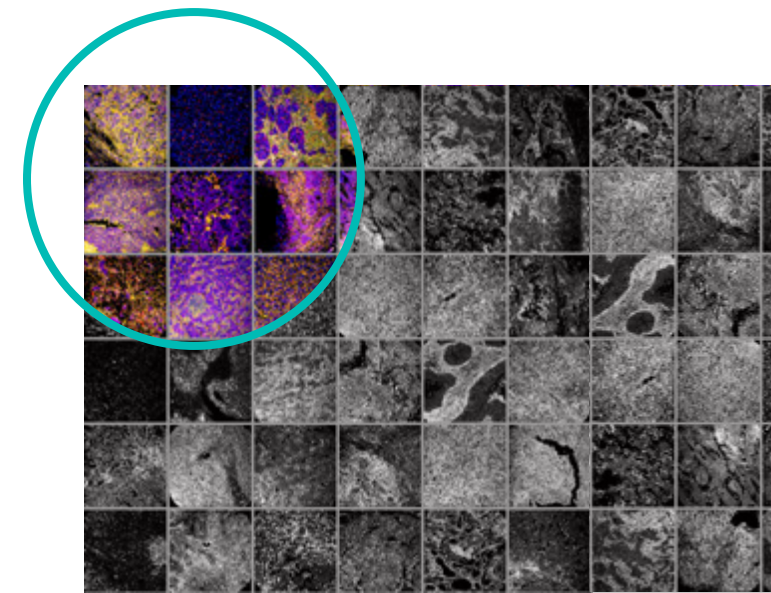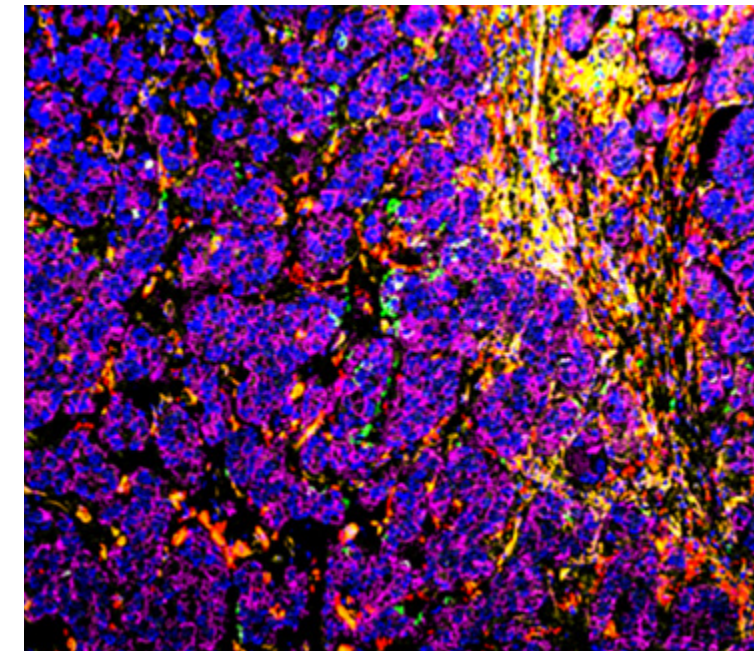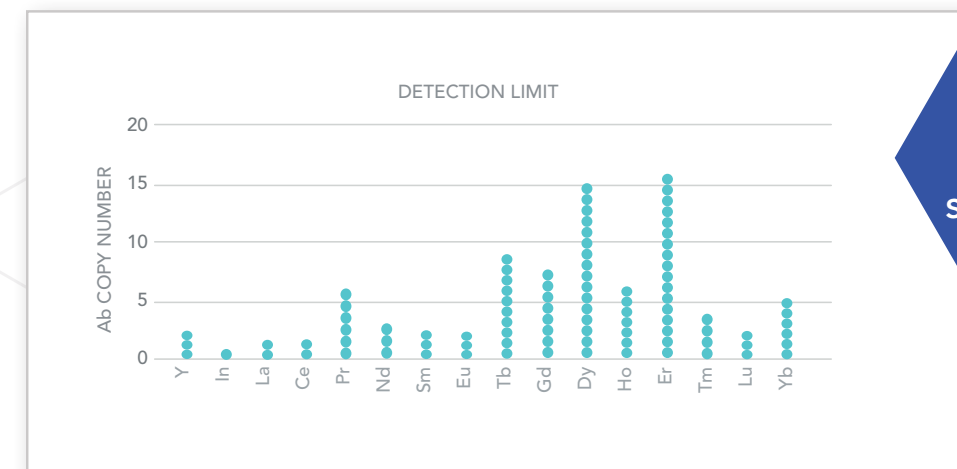
Single molecule sensitivity

Data adapted from Keren et al., Science Advances, 2019

PUBLICATION QUALITY
DATA

UNMATCHED
REPRODUCIBILITY

Analyze large clinical cohorts

Triple negative breast cancer

● H3K27me3   ● β-Catenin   ● CD68   ● Vimentin   ● HLA Class I   ● SMA   ● H3K9ac

Data adapted from
Keren *et al.*, *Cell*, 2018

dsDNA 89Y
[R=0.05 P=0.7]

β-catenin 166Er
[R=0.09 P=0.6]

CD56 145Nd
[R=0.007 P=0.9]

COUNTS

ACQUISITION TIME
[DAYS]
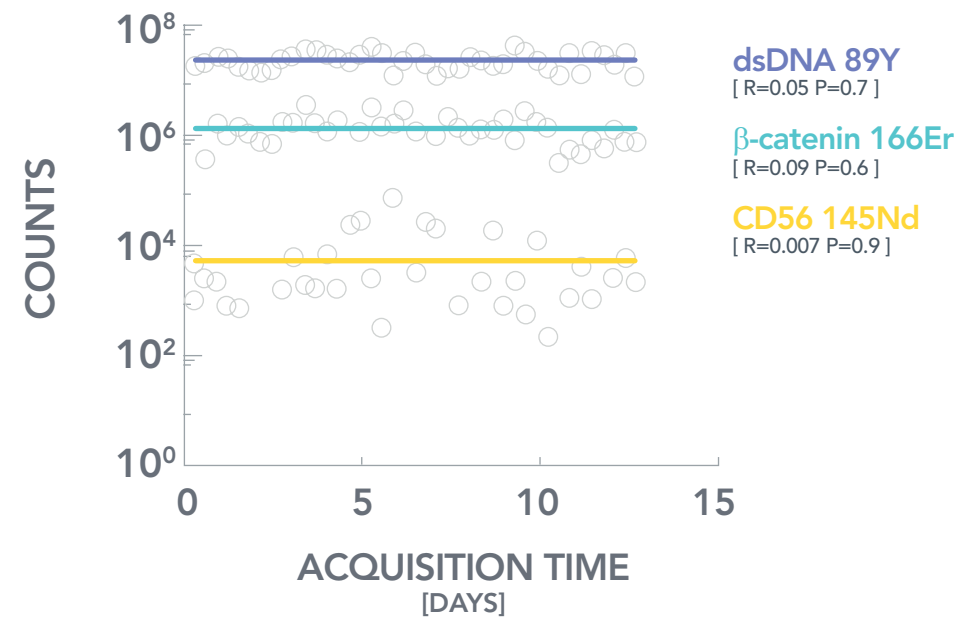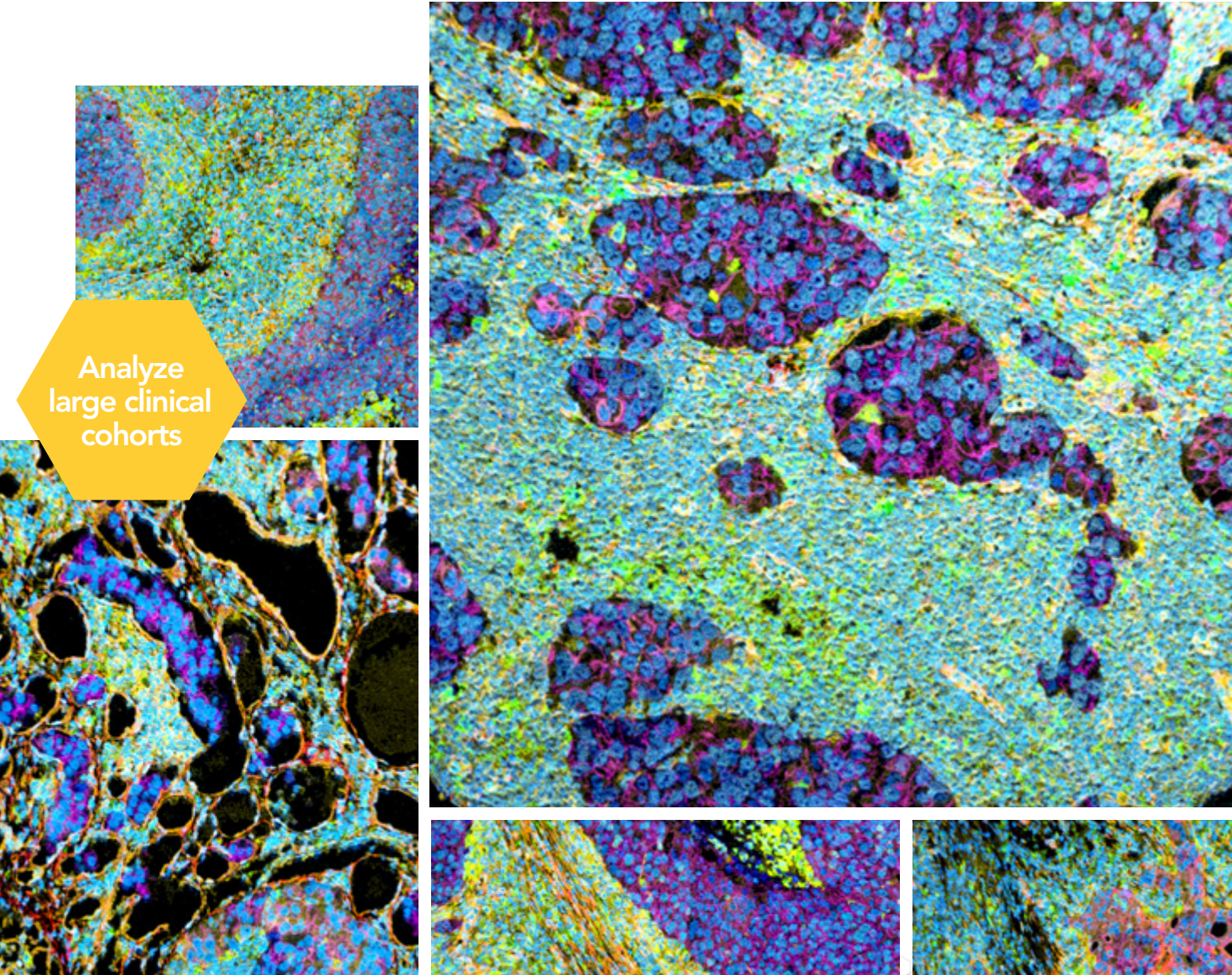
The MIBIscope has minimal signal drift over multiple weeks of data collection, so large clinical trials can be imaged and analyzed with confidence.

OPERATES LIKE A TRADITIONAL MICROSCOPE

WITH FAST SCAN AND HIGH RESOLUTION SETTINGS

100 μm

COARSE
16 min
800x800 μm²
1 μm resolution

FINE
68 min
800x800 μm²
650 nm resolution

INTUITIVE DATA VISUALIZATION AND EASY DATA SHARING
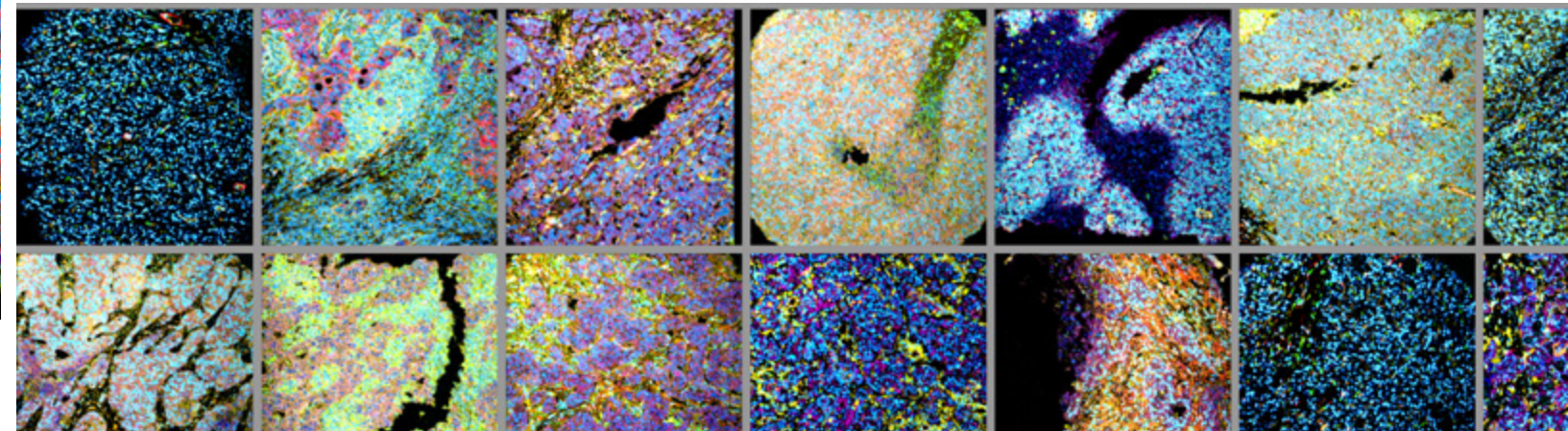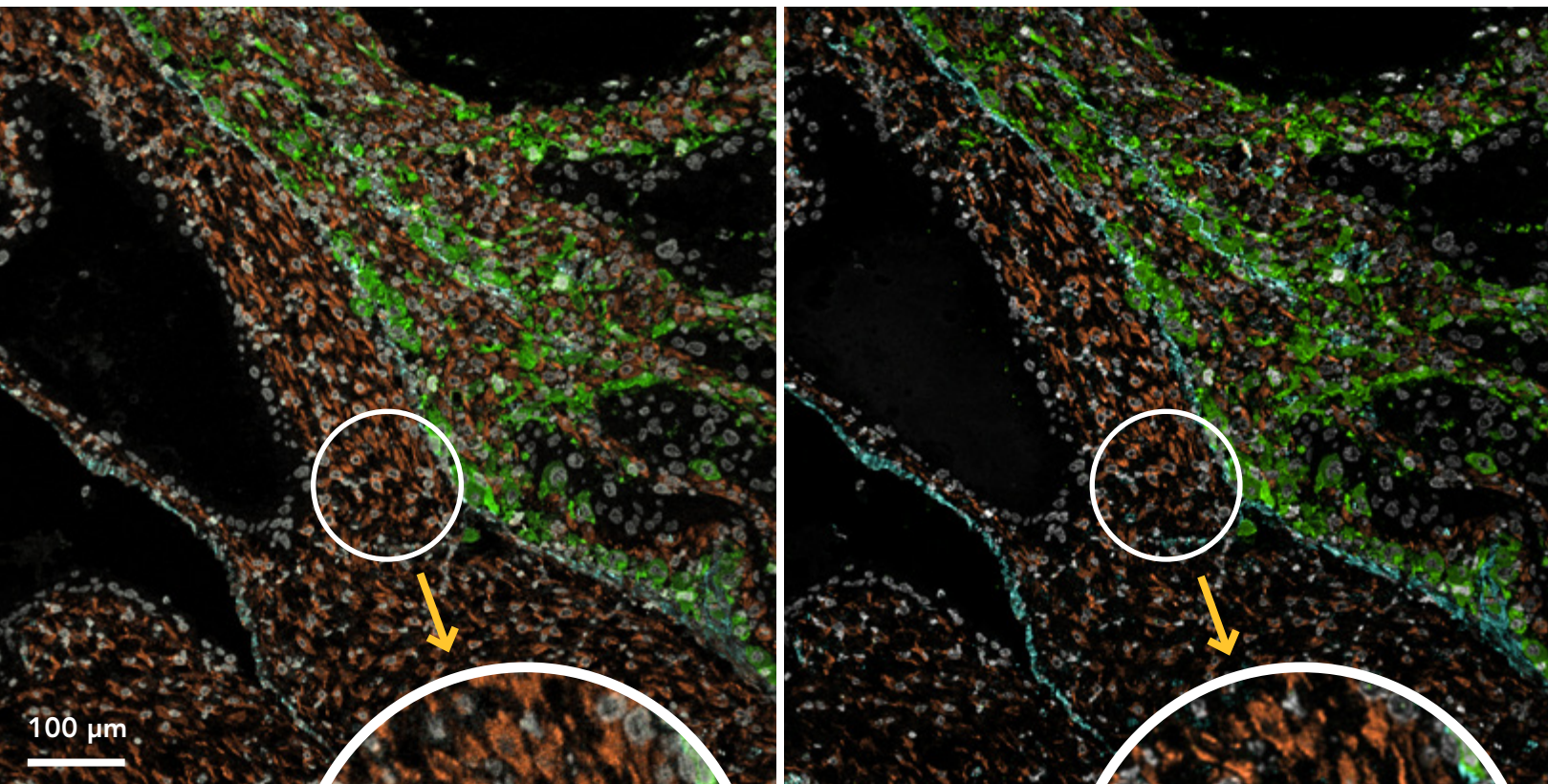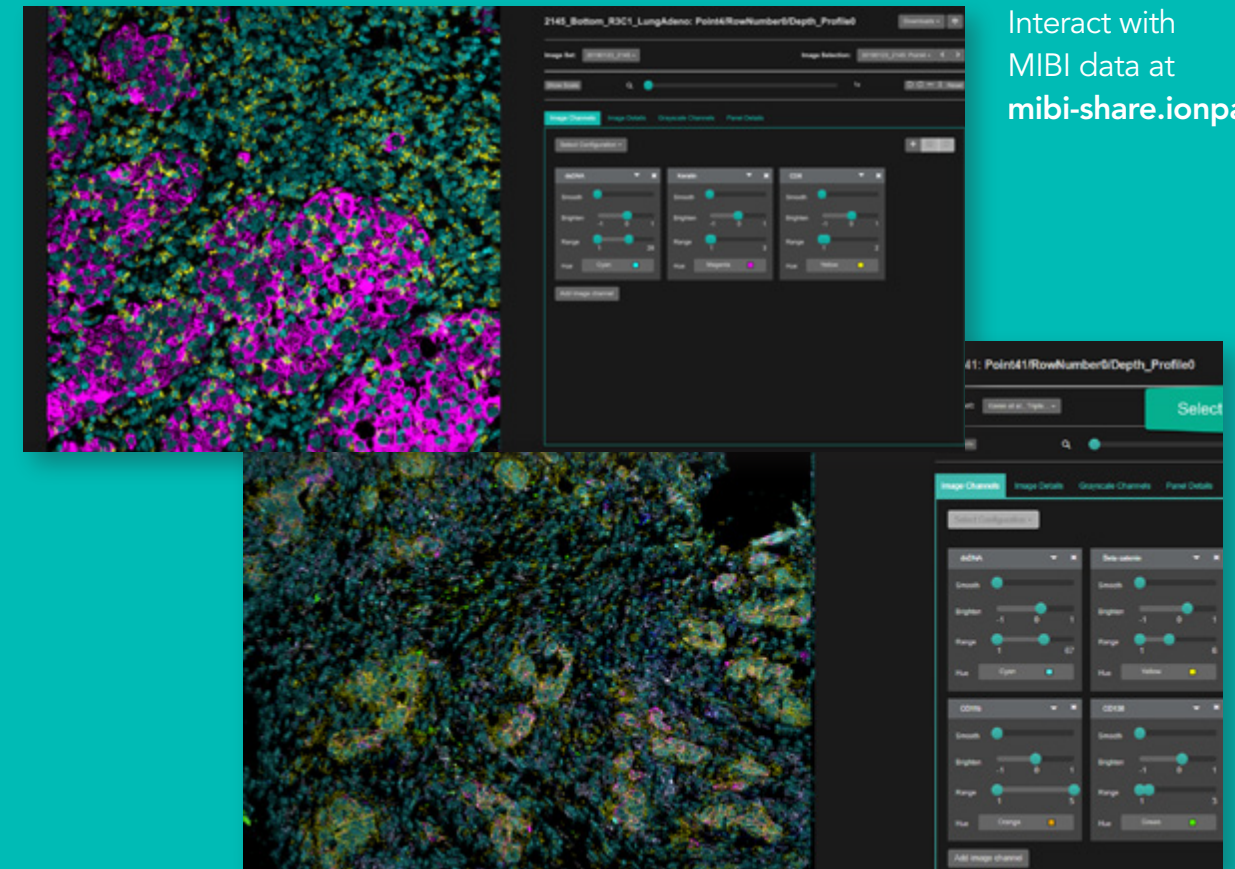

Interact with MIBI data at **mibi-share.ionpath.com**

MIBItracker cloud-based data management and visualization platform

MIBItracker software enables review of image quality following a run, assessment of expression profiles across multiple cells, and evaluation of immune cell populations through a web browser.

Image files can be exported as TIFFs and readily inserted into publications or used in subsequent analysis in third-party packages such as Fiji, HALO®, VisioPharm®, and QuPath.

REVOLUTIONARY DATA
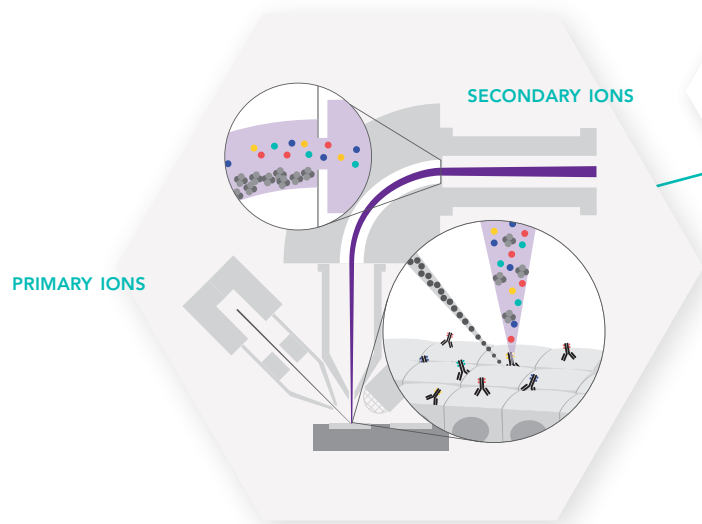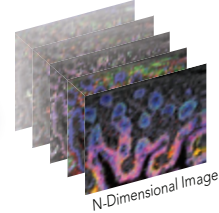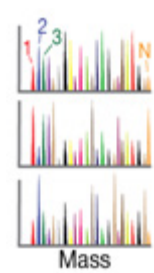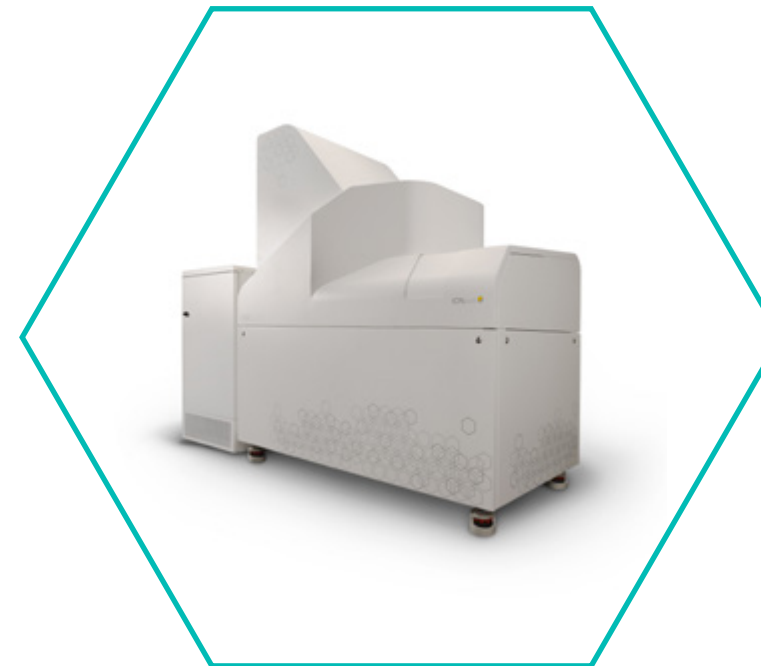## DELIVERED RELIABLY

MULTIPLEXED ION BEAM IMAGING

SECONDARY IONS

PRIMARY IONS

TIME-OF-FLIGHT

Mass

N-Dimensional Image

40+ MARKER SIMULTANEOUS DETECTION

A COMPLETE PLATFORM

- Robust instrumentation
- Highly validated reagents
- Easy-to-use software

MIBI TECHNOLOGY

MIBI Technology is based on secondary ion mass spectrometry or SIMS. With SIMS, a primary ion beam is rastered across the surface of a sample, liberating reporter ions that are then simultaneously recorded on a pixel-by-pixel basis by Time-of-Flight detection. An ion beam, unlike a laser, enables resolution to be tuned over a broad range—in the case of the MIBIScope, from 280 nm to 1 micron. Once liberated, the reporter ions, or "secondary ions," travel uninterrupted at super sonic speed from the sample to the detector, leading to fast acquisition and extraordinary sensitivity.

24/7 DATA GENERATION

Prior to the advent of MIBI technology, SIMS was primarily used in the semiconductor industry, where SIMS instruments are relied on to produce consistent data with round-the-clock operation. IONpath has leveraged decades of advancements in SIMS to develop an instrument capable of producing revolutionary data 24/7.
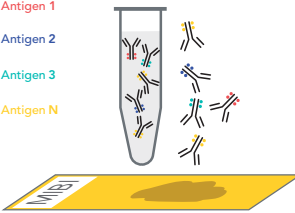
EASILY INTEGRATES INTO
PATHOLOGY WORKFLOWS

40+ MARKERS

SINGLE STEP
STAINING

SINGLE STEP
IMAGING

PREPARE
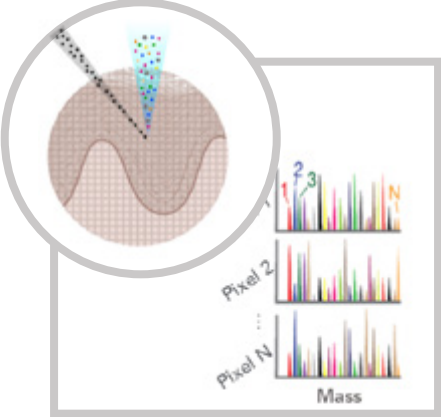
MIBI is compatible with all
common sample types, including
FFPE and fresh/frozen tissue.

STAIN

Antigen 1
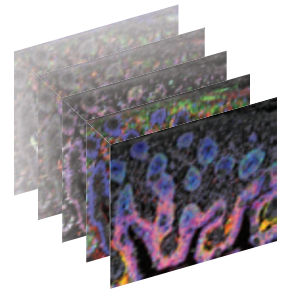Antigen 2
Antigen 3
Antigen N

Tissue is stained with metal-tagged
antibodies using a standard IHC
staining protocol. All markers are
stained in a single step and the
sample is stable for months post
staining.

DETECT

The sample is analyzed using
secondary ion mass spec (SIMS).
Low resolution survey scans can be
collected prior to high resolution
imaging. The sample is not
destroyed during imaging and it
can be stored for follow-on studies
or utilized for additional analyses.

IMAGE

MIBI outputs TIFF images,
which can quickly and easily
be viewed on MIBItracker or
exported for subsequent analysis
with third-party software.

ANALYZE

VISUALIZE

QUANTIFY

DISCOVER
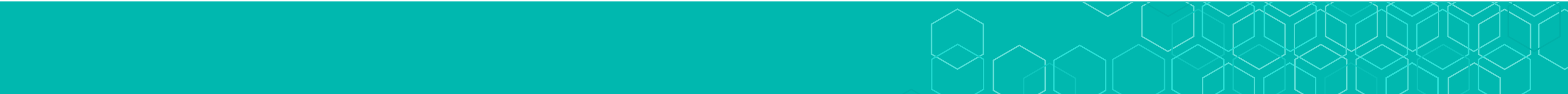
REAGENTS

Use our preset panels or label your own antibodies

IO Biomarker Panels

Preset, multiplexed panels permit broad characterization of the tumor microenvironment. Each panel has been extensively validated on a variety of tumor and normal tissue types to ensure optimal performance across a wide set of sample types.

Conjugated Antibodies

Supplement biomarker panels with additional pre-conjugated antibodies or build a unique panel of pre-conjugated antibodies.

Conjugation Kits

Label any antibody of interest for MIBI with a straightforward protocol that can be completed in an afternoon.

CHECKPOINT PANEL	EPITHELIAL IO PANEL	LYMPHOMA IO PANEL
Arginase-1	β-Tubulin	β-Tubulin
β-Tubulin	CD3	CD3
CD3	CD4	CD4
CD8	CD8	CD8
CD11b	CD11b	CD11b
CD11c	CD11c	CD11c
CD20	CD20	CD20
CD31	CD31	CD21
CD45	CD45	CD31
CD56	CD45RO	CD45
CD68	CD56	CD45RO
CD163	CD68	CD56
dsDNA	CD163	CD68
FOXP3	DC-SIGN	CD163
HLA Class 1	dsDNA	DC-SIGN
HLA DR	FOXP3	dsDNA
IDO1	Granzyme B	FOXP3
Keratin	HLA Class 1	Granzyme B
Ki-67	HLA DR	HLA Class 1
LAG3	IDO1	HLA DR
Na/K ATPase	Keratin	IDO1
PD-1	Ki-67	Ki-67
PD-L1	LAG3	LAG3
TIM-3	Na/K ATPase	Na/K ATPase
	PD-1	PAX5
	PD-L1	PD-1
	Podoplanin	PD-L1
	Vimentin	Vimentin

Contact us
sales@ionpath.com
833.466.7284
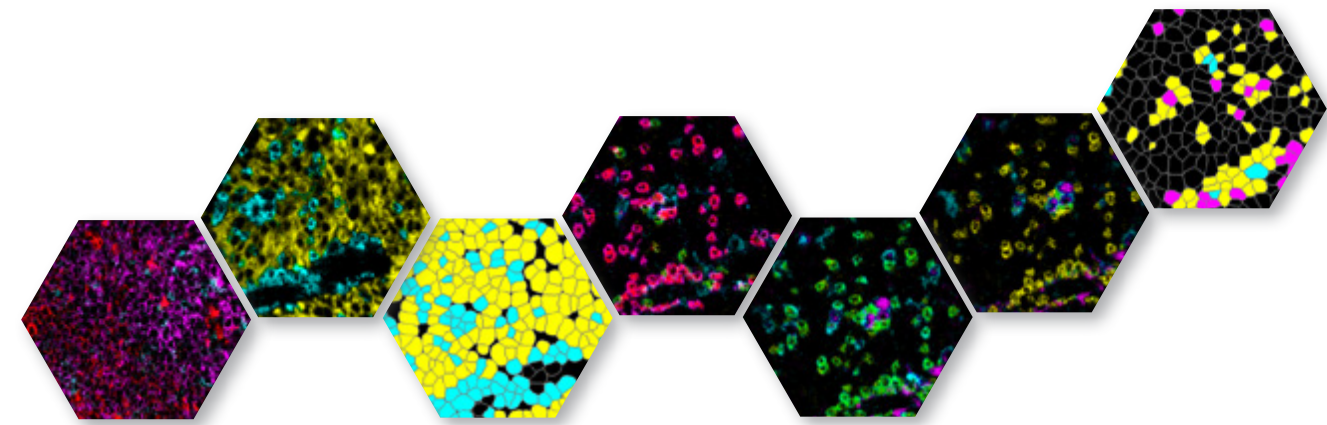
ION path

www.ionpath.com

IONpath, Inc. | 960 O'Brien Drive, Menlo Park, CA 94025