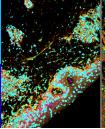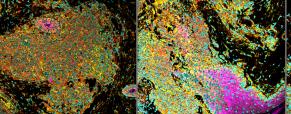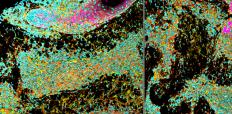# Ionpath
Antibody Panels

Validated antibody panels for
Ionpath Spatial Proteomic Services

IONPATH

Cell Classification Panel

- Ideal for basic immune profiling

- Identifies up to 12 cell populations

- Expand as needed with add-on or custom markers

The Cell Classification Panel is an ideal starting panel for immune profiling of human FFPE tissue samples and provides classification of up to 12 cell populations. The antibody panel can be used for immune infiltrate analysis of the tumor microenvironment.

16-MARKER PANEL

β-Tubulin	CD11c	CD56	HLA DRDPDQ
CD3	CD20	CD68	Na/K ATPase α1
CD4	CD31	dsDNA	Vimentin
CD8	CD45	HLA Class 1	Tumor Marker*

* Keratin, SOX10, or PAX5

Advanced Cell Classification Panel

- Ideal for expanded immune profiling

- Identifies up to 26 cell populations

The Advanced Cell Classification Panel is ideal for immune profiling—providing classification of up to 26 cell populations and the flexibility to customize analysis with up to 16 additional markers.

24-MARKER PANEL

β-Tubulin	CD31	HLA Class 1
CD3	CD45	HLA DRDPDQ
CD4	CD45RO	Ki-67
CD8	CD56	Na/K ATPase α1
CD11b	CD68	Podoplanin
CD11c	CD163	SMA
CD14	dsDNA	Vimentin
CD20	FOXP3	Tumor Marker*

* Keratin, SOX10, or PAX5

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Checkpoint Panel

- Comprehensive immune profiling
- Checkpoint expression reported for all cell types
- Identifies up to 28 cell populations

The Ionpath Checkpoint Panel is ideal for immune profiling of tissue samples and provides classification of up to 28 cell populations as well as checkpoint expression analysis. The antibody panel is often the first choice for immune infiltrate analysis of the tumor microenvironment.

30-MARKER PANEL

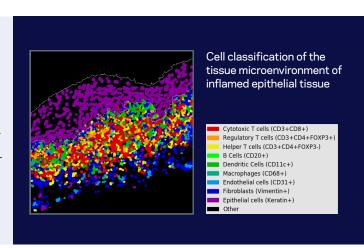|			
β-Tubulin	CD31	Granzyme B	PD-L1
CD3	CD45	HLA Class 1	Podoplanin
CD4	CD45RO	HLA DRDPDQ	SMA
CD8	CD56	IDO1	TIM-3
CD11b	CD68	Ki-67	Vimentin
CD11c	CD163	LAG3	Tumor Marker*
CD14	dsDNA	Na/K ATPase α1	
CD20	FOXP3	PD-1	

*Keratin, SOX10, or PAX5

Validated Add-on Markers also available
(Ask our team or see the Add-on Marker list)

APPLICATION SPOTLIGHT

The **Ionpath Checkpoint Panel** was used in a study that analyzed the immune infiltrate and spatial signatures of tissue samples from patients with various types of skin inflammation.

The cell phenotype landscape (right), and further spatial analysis, identified which populations were nearest to epithelial cells and how the tissue organization varied between samples.

Cell classification of the tissue microenvironment of inflamed epithelial tissue

Cytotoxic T cells (CD3+CD8+)
Regulatory T cells (CD3+CD4+FOXP3+)
Helper T cells (CD3+CD4+FOXP3-)
B Cells (CD20+)
Dendritic Cells (CD11c+)
Macrophages (CD68+)
Endothelial cells (CD31+)
Fibroblasts (Vimentin+)
Epithelial cells (Keratin+)
Other

Comparison of Antibody Panels

- Identifies up to 12, 26, or 28 cell populations, respectively

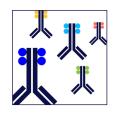- Flexibility to include validated add-on markers (for up to 40 markers)

FOR HUMAN FFPE TISSUE

ANTIBODY	CELL CLASSIFICATION PANEL 🟠	ADVANCED CELL CLASSIFICATION PANEL 🟢	CHECKPOINT PANEL 🔵
	16 MARKERS	24 MARKERS	30 MARKERS
β-Tubulin	■	■	■
CD11c	■	■	■
CD20	■	■	■
CD3	■	■	■
CD31	■	■	■
CD4	■	■	■
CD45	■	■	■
CD56	■	■	■
CD68	■	■	■
CD8	■	■	■
dsDNA	■	■	■
HLA class 1	■	■	■
HLA DRDPDQ	■	■	■
Na-K-ATPase	■	■	■
Tumor Marker	■	■	■
Vimentin	■	■	■
CD11b		■	■
CD14		■	■
CD163		■	■
CD45RO		■	■
FOXP3		■	■
Ki-67		■	■
Podoplanin		■	■
SMA		■	■
Granzyme B			■
IDO1			■
LAG3			■
PD-1			■
PD-L1			■
TIM-3			■

For Research Use Only (RUO). Not for diagnostic use.

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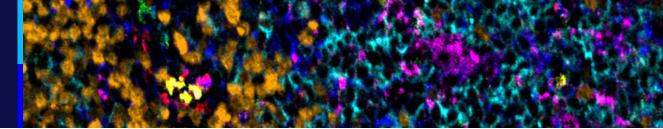# Cell Classification with Human Antibody Panels

CELL TYPE	PHENOTYPE
Tumor cells	Keratin+, PAX5+ or SOX10+
Proliferating tumor cells	Keratin+ Ki-67+, PAX5+ Ki-67+, or SOX10+ Ki-67+
Immune cells	CD45+
Proliferating immune cells	CD45+ Ki-67+
Myeloid cells	CD11b+
Macrophages	CD68+
M1 macrophages	CD68+ CD163-
M2-macrophages	CD68+ CD163+
Monocytes	CD14+
M2-monocytes	CD14+ CD68- CD163+
Dendritic cells	CD11c+ HLA DRDPDQ+ CD14-
NK cells	CD3- CD56+
Activated NK cells	CD3- CD56+ Granzyme B+
B cells	CD20+
T cells	CD3+
Helper T cells	CD3+ CD4+
Naive helper T cells	CD3+ CD4+ CD45RO-
Memory helper T cells	CD3+ CD4+ CD45RO+
Cytotoxic T cells	CD3+ CD8+
Naive cytotoxic T cells	CD3+ CD8+ CD45RO-
Memory cytotoxic T cells	CD3+ CD8+ CD45RO+
Activated cytotoxic T cells	CD3+ CD8+ Granzyme B+
Regulatory T cells	CD3+ CD4+ FoxP3+
Blood vessels	CD31+
Lymphatics	Podoplanin+
Fibroblasts	Vimentin+
Myofibroblasts	Vimentin+ SMA+
Smooth muscle	SMA+

With the Checkpoint Panel, PD-1, PD-L1, LAG3, TIM-3, and IDO-1 expression is quantified for each classified cell type.

KEY | PANEL FOR IDENTIFICATION
- with Cell Classification Panel
- with Advanced Classification Panel
- with Checkpoint Panel

- Provides deeper classification of tumor cells and immune infiltrate
- Further classifies sub-populations of T cells and dendritic cells

Validated Add-on Markers

A selection of validated markers is available for use with any of the human Antibody Panels. These markers can be used to classify additional cell phenotypes for deeper profiling, including subsets of T cells, dendritic cells, and tumor cells.
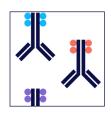
VALIDATED CONJUGATED ANTIBODIES FOR HUMAN FFPE TISSUE

Arginase-1	CD21	● CD86	iNOS
● Bcl2	● CD23	COL1A1	MPO
CD117	● CD26	CXCR5	p53
● CD123	CD36	Cytokeratin 5	SIRPα
CD138	CD38	● GATA3	● T-bet/Tbx21
● CD16	CD47	Helios	● TIGIT
CD206	CD5	Histone H3	TSP-1
CD209	CD57	HLA DRDPDQ	

● = NEW

Additional Cell Classification & Phenotyping with Add-on Markers

MARKER	APPLICATION
Arginase-1	Marker Expression
BCL2	Marker Expression
CD117	CD117+ tumor cells
CD123	Plasmacytoid dendritic cells (CD123+CD11c-CD31-Podoplanin-)
CD138	Plasma cells (CD3-CD56-CD138+)
CD16	NK cells (CD16+CD3-CD68-CD14-CD163-) Inflammatory Monocytes (CD14+CD16+CD3-CD68-) Macrophages (CD68+CD16+CD56-CD3-)
CD206	Inflammatory macrophages (CD68+HLA-DRDPDQ+CD206-) Tissue-resident macrophage (CD14-CD68+HLA-DRDPDQ+CD163+CD206+)

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Cell Classification *continued*

MARKER	APPLICATION
CD209	Monocyte-derived DCs (CD14-CD11c+HLA-DRDPDQ+CD209+) Conventional DCs (CD14-CD11c+HLA-DRDPDQ+CD209-)
CD21	Follicular dendritic cells (CD31-CD20-CD21+) marginal and mantle zone B cells (CD21+CD20+)
CD23	Follicular dendritic cells (CD23+CD21+)
CD26	CD26+ Helper T cells (CD3+CD4+CD26+) CD26+ Cytotoxic T cells (C3+CD8+CD26+) cDC1 (CD14-CD11c+HLA-DRDPDQ+CD26+)
CD36	Keratin+CD36+ Tumor cells CD36+ regulatory T cells (CD3+CD4+FoxP3+CD36+) CD36+ monocytes (CD14+CD68-CD36+) CD36+ macrophages (CD68+CD36+)
CD38	Plasma cells (CD3-CD56-CD38+)
CD47	Keratin+CD47+ Tumor cells
CD5	T cells (CD3+CD5+)
CD57	CD57+ Helper T cells (CD3+CD4+CD57+) CD57+ Cytotoxic T cells (C3+CD8+CD57+) CD57+ NK cells (CD3-CD56+CD57+) CD57+ NKT cells (CD3+CD56+CD57+)
CD86	Activated conventional dendritic cells (CD11c+CD14-CD86+) Activated monocyte-derived dendritic cells (CD11c+CD14+CD86+) Activated plasmacytoid dendritic cells (CD123+CD86+CD11c-)
CXCR5	T follicular helper cells (CD3+CD4+CXCR5+PD-1+) T follicular regulatory subset (CD3+CD4+CXCR5+PD-1+FOXP3+)
Cytokeratin 5	CK5+ tumor cells
GATA3	TH2 T cells (CD3+CD4+GATA3+)
Helios	Helios+ Helper T cells (CD3+CD4+Helios+) Helios+ Cytotoxic T cells (CD3+CD8+Helios+) Helios+ CD4+ Regulatory T cells (CD3+CD4+FOXP3+Helios+)
Histone H3	Marker Expression
iNOS	iNOS+ M1-macrophages (CD68+iNOS+) Marker Expression
MPO	MPO+ tumor cells MPO+ immune cells
p53	Keratin+p53+ tumor cells Activated MDSCs (CD11b+HLA-DRDPDQ-p53+)
SIRPalpha	Marker Expression
T-bet	TH1 T cells (CD3+CD4+T-bet+)
TIGIT	Marker Expression
TSP-1	Activated monocyte-derived dendritic cells (CD11c+CD14+CD86+)

Options to add and validate custom markers are also available
Ask our team

Mouse Advanced Cell Classification Panel

- Ideal for preclinical studies

- Identifies up to 25 cell populations

- Analyze activation marker expression

The Mouse Advanced Cell Classification Panel is ideal for preclinical studies using mouse FFPE tissue and provides classification of up to 25 cell populations as well as expression analysis of activation markers.

20-MARKER PANEL

CD11b	CD49b	Ki-67
CD11c	CD8	Ly6G
CD206	CDX2*	Na/K ATPase
CD3	dsDNA	PAX5*
CD31	F4/80	α-SMA
CD4	FoxP3	β-tubulin
CD45	Granzyme B	Vimentin

* Either CDX2 or PAX5 can be used in the 20th channel in the panel.

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