STANDARD BIOTOOLS™

Translating the complex immune system into disease insights with CyTOF technology

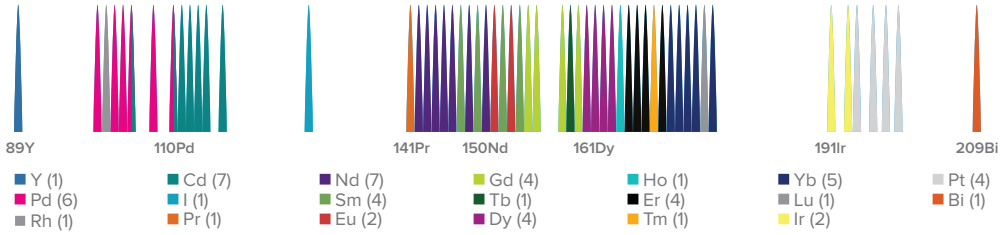
Reasons to choose CyTOF

THE CYTOF

Reasons to take your high-dimensional

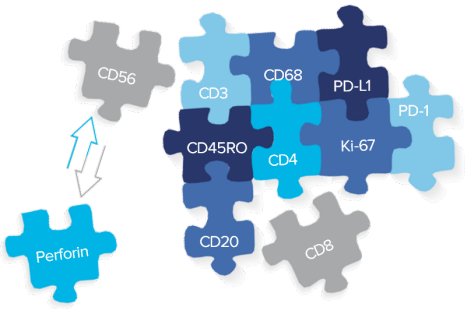
1 Precision data with discrete signals

Not impacted by spectral overlapping of fluorochromes and tissue autofluorescence



2 Easy panel design to complete experiments quicker

Large number of available antibodies without overlap simplifies panel design and expansion



Start with ready-to-go panels and easily swap markers in and out.

3 Reproducible and comparable

Stained samples can be frozen, stored and shipped to support longitudinal studies and multi-site workflows.

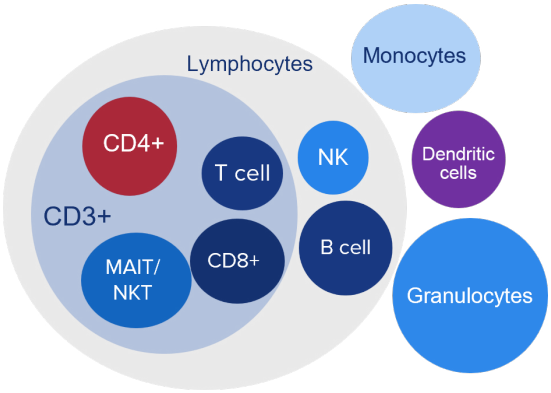
ADVANTAGE

research beyond the limits of fluorescence

4

Capture rare or unexpected cell populations

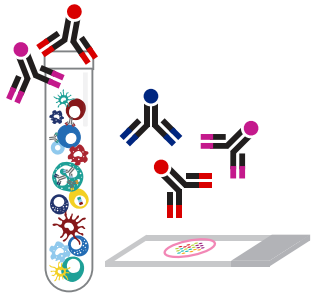
Unbiased, high-dimensional profiling of 40-plus markers to uncover diverse immune subpopulations



5

Minimal sample required, saving on limited clinical research material

Simultaneous staining and detection from a single tube or tissue scan, without multiple staining controls or time-consuming cyclic protocols



6

Trusted by researchers

The leading technology for high-parameter immune research

>2,000 publications

>200 clinical trials

Cytometry by time-of-flight (CyTOF® technology)

Applies purified heavy metal labels, not normally found in biological systems, instead of fluorophores

Risks of fluorescence

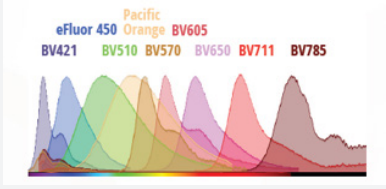
for high-parameter studies

Missed cell populations or **false positives**

More iterations required in panel design

Reduced sensitivity where fluorescence overlap occurs

Higher resource use to compensate for spectral overlap



From sample collection to high-dimensional insights **in 3 days***

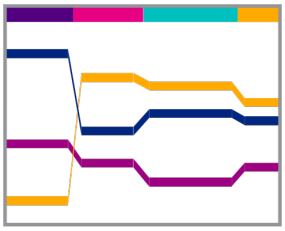
Flow cytometry

Get started with the validated Maxpar® Direct™ Immune Profiling Assay™.

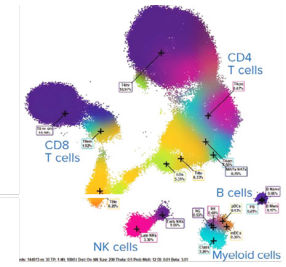
1 tube 30 markers
(<300 µL of whole blood)

CD3	CD28	CD161
CD4	CD38	CD294
CD8	CD45	CCR4
CD11c	CD45RA	CCR6
CD14	CD45RO	CCR7
CD16	CD56	CXCR3
CD19	CD57	CXCR5
CD20	CD66b	HLA-DR
CD25	CD123	IgD
CD27	CD127	TCRγδ

5 min analysis

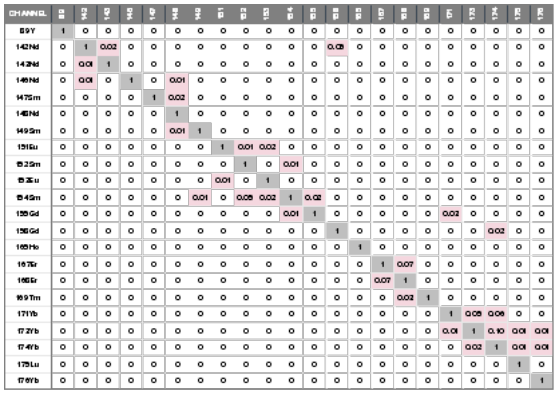


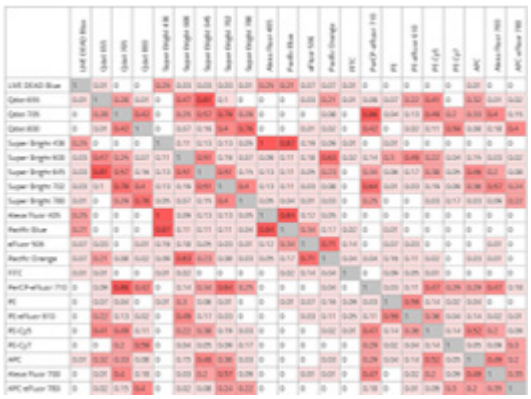
37 cell populations



Surface profiles
Cell proliferation
Apoptosis
Metabolism
Phosphoproteins
Cytokine production
Transcription factors

Minimal signal overlap





The CyTOF flow cytometry image (far left) shows minimal spillover between metal channels when compared with the same panel from a competitor spectral flow cytometer (left).

Quantify and visualize 40-plus markers in a single run.

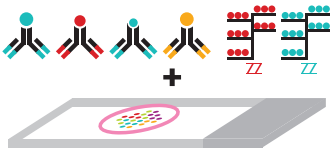
* After panel and image analysis optimization

Whether you are analyzing suspension or tissue samples, time-of-flight (TOF) technology combined with Maxpar® reagents enables a streamlined end-to-end workflow to complete high-parameter experiments faster than fluorescence-based detection.

Tissue imaging

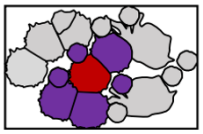
Get started with our Maxpar IMC™ Cell Segmentation Kits and ready-to-go high-plex panels.

Simultaneous staining



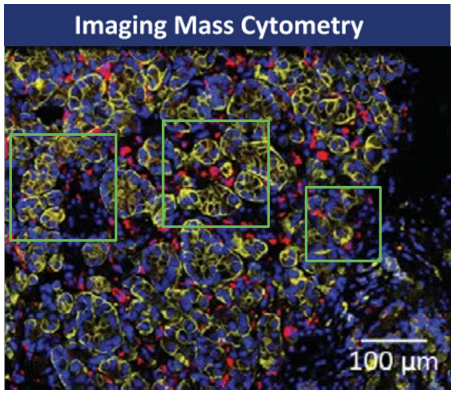
One-step detection

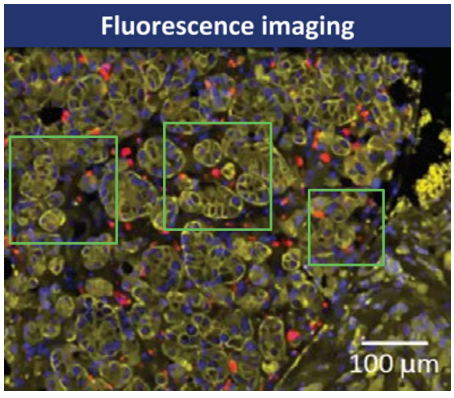
High-plex data in minutes



Tissue architecture
Protein modifications
Signaling pathway activation
Cell injury states
Cell proliferation
Transcriptional signatures

Clear spatial imaging





The Imaging Mass Cytometry™ image (far left) shows many well-defined red signals from CD68 that are indistinct or missing from the fluorescence image (left).

Without compromise.

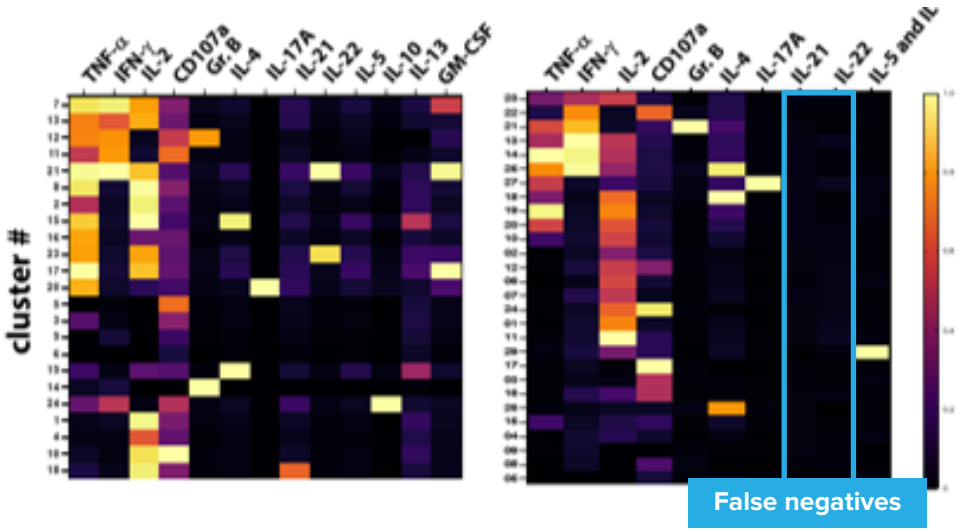
Results you can trust, reproduce and publish

See more with CyTOF
Flow cytometry

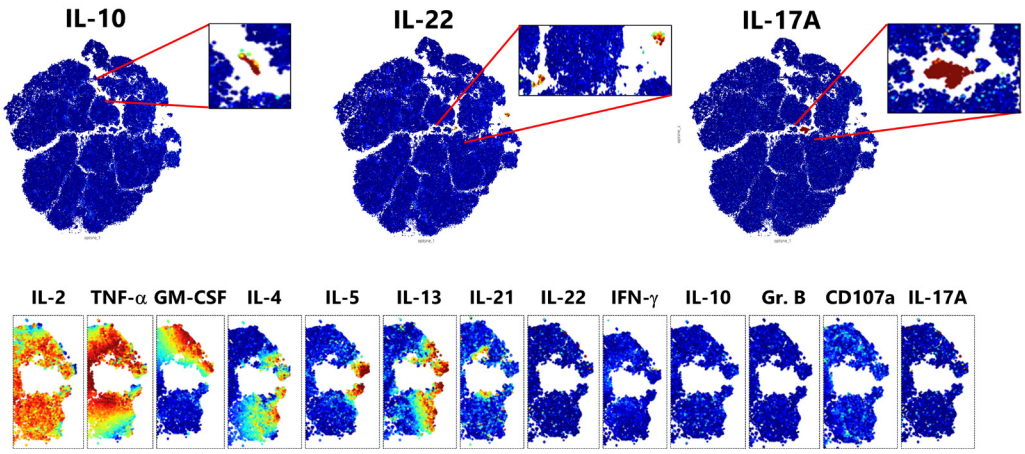
CyTOF detects more immune subpopulations in a single cell compared to full spectrum flow cytometry (FSFC).

Detect more cell populations with greater functional diversity.

The heat map on the left shows detection of IL-21 and IL-22, not present in the spectral data. Additionally, IL-5 and IL-10 were detected by CyTOF in independent channels.



Clear resolution and detection of low-frequency immune cells



Application of opt-SNE to this CyTOF dataset highlights distinct combinations of effector functions from type 1, type 2 and type 17 lineages.

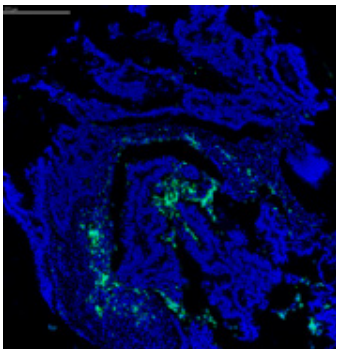
This data features findings from a comparison study using a 28-marker common panel including 12 cytokines. Data provided by Boston University.

See your **true biology**

See clearly with IMC
Tissue Imaging

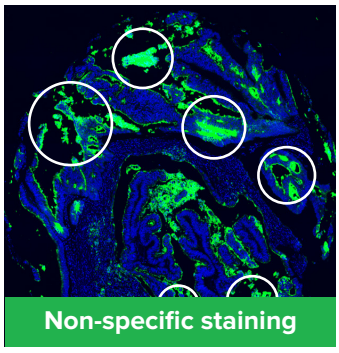
IMC allows highly specific staining without the challenges of autofluorescence or false positives inherent to cyclic fluorescence-based imaging (cycF).

IMC



CD66b DNA

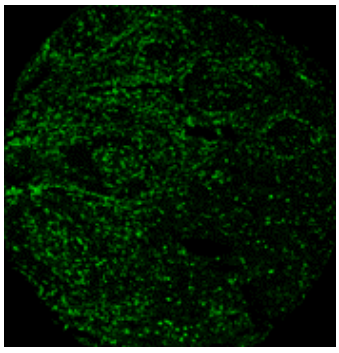
cycF



CD66b DNA

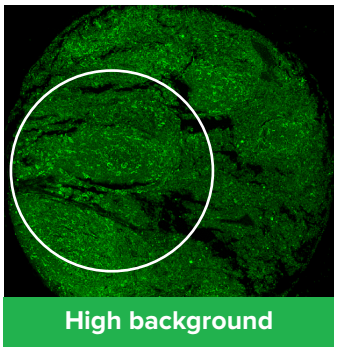
The cycF image (right) shows non-specific false-positive CD66b signal in colon adenocarcinoma.

IMC



CD11C

cycF

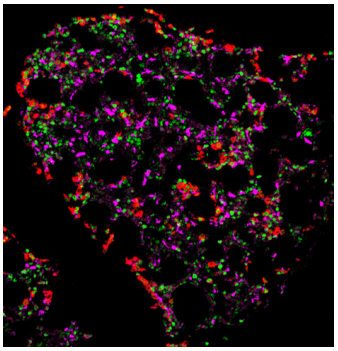


CD11C

CD11c signal is obscured by autofluorescence with cycF (right) in lymph node tissue.

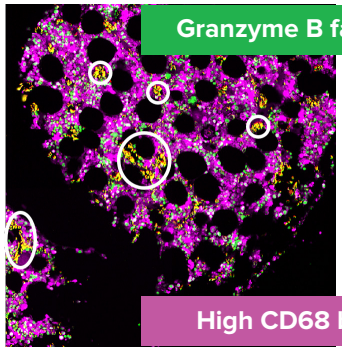
Image highly-autofluorescent tissue types without challenge

IMC

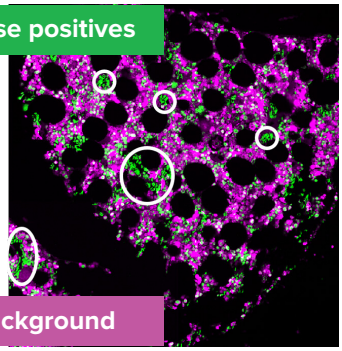


Ki-67 granzyme B CD68

cycF



Ki-67 granzyme B CD68



Ki-67 CD68

In bone marrow, cycF data (right) shows granzyme B signal co-localized to the nucleus with Ki-67. The normal cytoplasmic or membranous localization of granzyme B can only be seen with IMC (left). CD68 signal is clear with IMC but obscured with cycF.

Data generated from a comparison study with multiplex cyclic fluorescence (cycF) using a 27-marker common panel. Cyclic fluorescence data provided by Georgetown University.

The CyTOF **Advantage.**

A trusted technology used in

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Over 2,000 peer-reviewed publications

> For **any** phase
> of research

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