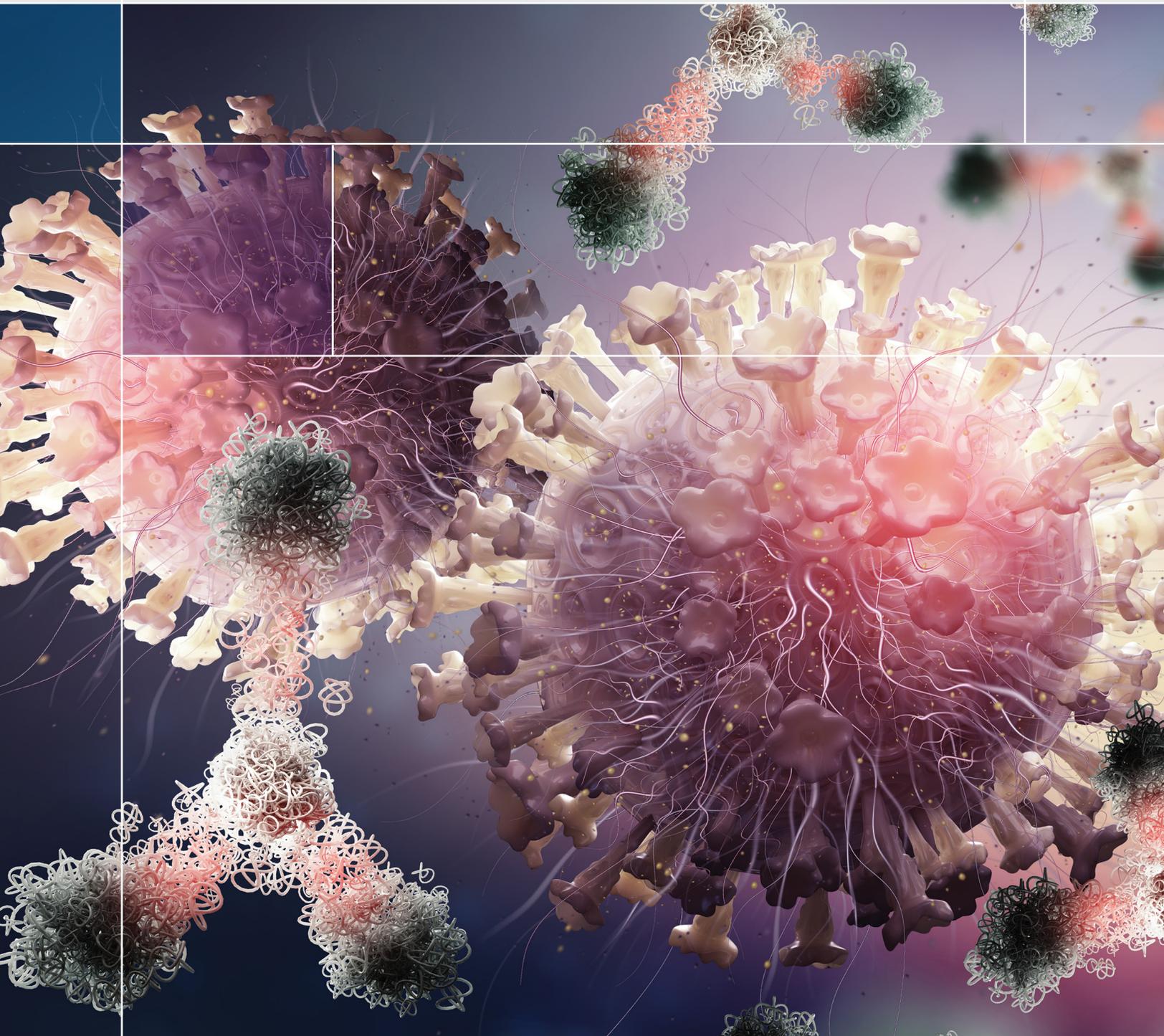# PRECISION
for medicine ®

Immune Monitoring Solutions

Precision provides an industry-leading array of comprehensive immune monitoring solutions, from the development of customized assays for early clinical studies to managing the logistical and immune monitoring testing needs of global, multi-site studies. We leverage multiple technology platforms on a global scale, including proprietary innovations developed in-house, like Epiontis ID, which provides immunophenotyping and allows quantification regardless of cell viability, and Apostream, which is used for rare cell enrichment. Our expertise also includes analyzing immune status of tumor or tissue biopsies, and liquid biopsy analysis of rare circulating tumor cells.

Globally delivered immune monitoring solutions

Flow Cytometry

Delivering both research and CLIA flow cytometry with advanced capabilities including tetramer flow, receptor occupancy, and up to 31 parameters per panel

Cytokine Profiling

Cytokine profiling via ELISA, as well as multiplex cytokine profiling via MSD, Luminex, and Quanterix instrumentation

Cell Phenotyping by Epiontis ID

Proprietary approach for immune cell phenotyping via epigenetic markers. Over 30 validated assays for excellent accuracy and rapid data delivery

ELISpot and FluorSpot

Sensitive assays for the enumeration of cytokine-secreting cells at the single cell level

Immunohistochemistry

Tissue-based assays to support early-stage studies, such as CLIA-validated PDL-1 detection for real-time patient selection strategies, through Phase III trials

Quantitative Multiplex Immunofluorescence

Concurrent visualization of up to 9 markers provides spatial information of immune cell infiltration into tissues such as tumors, as well as spatial distribution of cell types in a sample

Sample Processing & Logistics

A global network of sample processing labs and a robust logistics network ensure rapid processing and consistent sample quality
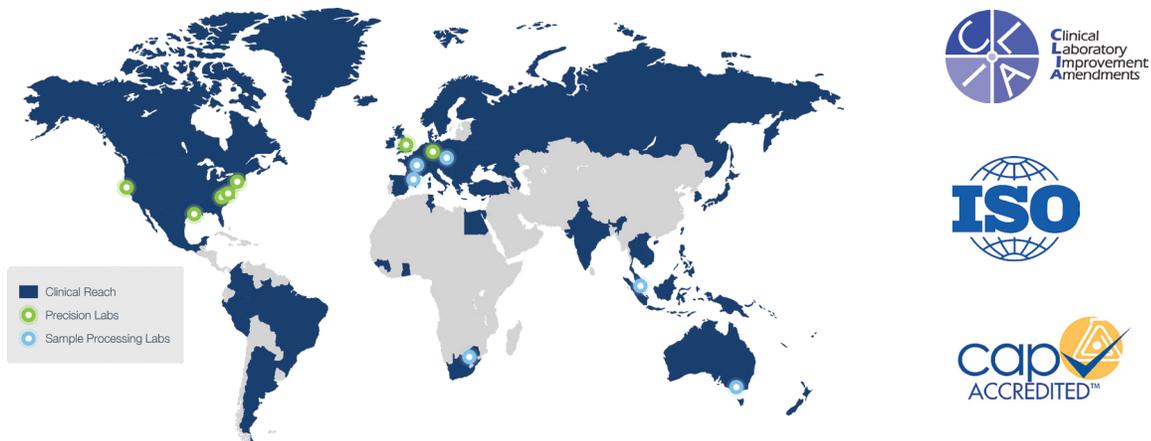
Exceptional global specimen logistics ensure sample integrity

Consistent sample processing is critical for biomarker-driven studies. Precision designs kits based on each unique clinical protocol to support single and multi-site clinical trials worldwide. With a global network of interconnected labs, a state-of-the-art biorepository, and coordinated processes from sample collection to analysis, Precision maximizes a sample's potential by limiting pre-analytical variables.

Full range of applications:

- ~100,000 sq. ft. biorepository

- PBMC isolations, cryopreservation, characterization, and same- or next-day processing worldwide

- Custom kit development with multi-component traceability and expertise collecting a wide array of sample types

- Blood fractionation for isolation of serum, plasma, and multiple cell types

- Kit processing for multiple sample types including stool for microbiome analysis, saliva, and solid tissue

- Cell-line immortalization and expansion with >97% expansion rate

- Custom processing and characterization studies

- SOPs for laboratory services, customizable on demand

Global reach

Clinical Reach
Precision Labs
Sample Processing Labs

Track record

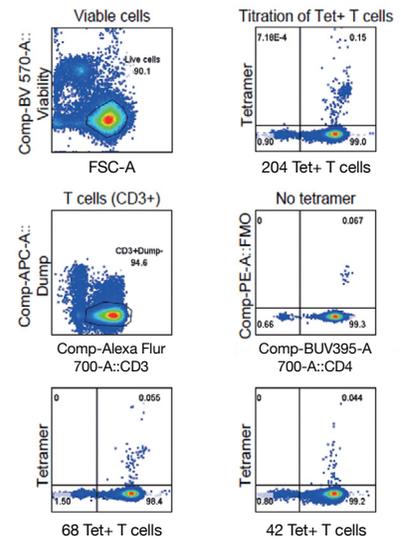| ACTIVE SAMPLE PROCESSING IN:	LABS IN US, ASIAPAC, AUS, EU, AND SOUTH AFRICA:	EXPERIENCED CRO MANAGING GLOBAL TRIALS:	INDUSTRY STANDARDS:
>55	**13**	**20+**	**GLP (PRECLINICAL), GCLP (CLINICAL), ISO 13485/ISO 9001, ISO 17025:ISO 9001, CAP, CLIA**
COUNTRIES	LABS	YEARS	

Multiparameter flow cytometry with pre-validated and customizable assays delivers comprehensive cell analysis

Precision provides a wide range of high-complexity flow assays suitable for proof of concept, exploratory, secondary, or primary clinical trial endpoints. With deep immunophenotyping capabilities and cutting-edge machines, Precision has a proven track record of robust and reliable performance.

Range of assays including

- Immunophenotyping for:
    - Specific cell types
    - Cell activation
    - Checkpoint molecule expression
    - Exhaustion
- Receptor occupancy
- Phospho-Flow (eg, p-ERK and p-STAT)

- Intracellular cytokine staining (ICS)
- Class I & Class II tetramer flow cytometry for antigen-specific T cell states
- CAR-T flow panels
- Fluorescence activated cell sorting (FACS)

Development and validation of tetramer staining for use as a biomarker for assessing gluten-specific T cells in clinical studies (*18 International Celiac Disease Symposium • 4–7 September 2019 • Paris, France*)
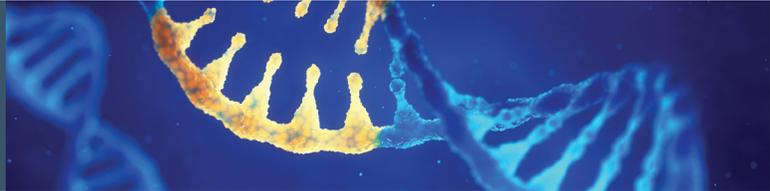
- Validated CLIA assays
- Up to 31 colors per panel with options for multiple panels for additional parameters
- Fresh flow supported by a global kitting, sample processing, and logistics network

Flow cytometry is ideal for:

- Evaluating immunomodulatory drugs or biologics to identify and characterize the impact on specific cellular subsets, casting a wide net to look at up to 31 parameters

- Measuring receptor occupancy to determine whether a particular drug has reached saturation for a given cell type, providing key data for target engagement, mechanism of action, and to aid in dose determination

- Evaluating target engagement either through phenotypic analysis or by determining whether specific pathways have been triggered by measuring the phosphorylation status of specific proteins such as Erk or STAT using Phospho-Flow

- Measuring and characterizing immune responses for the development of vaccines, biologics, and immune-modulating drugs
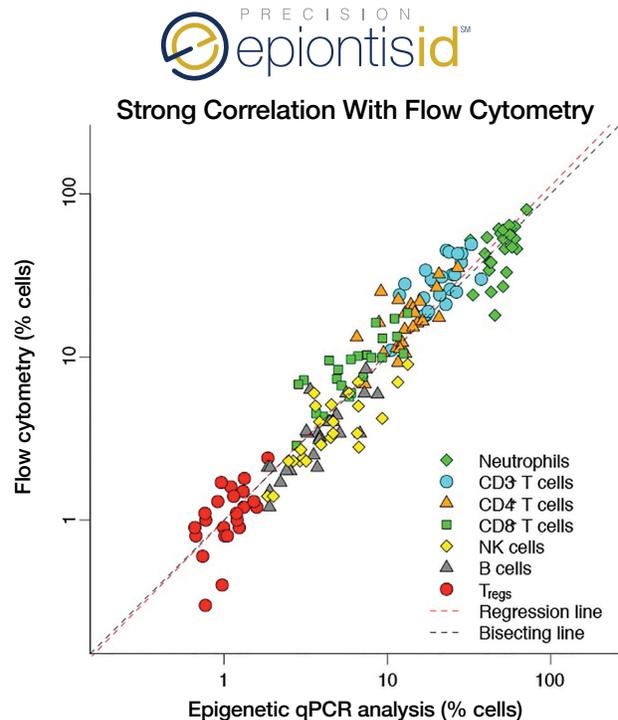
Proprietary DNA-based immune cell monitoring technology simplifies global logistics

This in-house developed immunophenotyping method allows precise cell number enumeration via qPCR in frozen blood and tissue samples. The elimination of any sample processing at the clinical site makes this method an ideal solution for large, multicenter studies.

- As little as 75 μL peripheral blood for a panel of up to 4 immune cell types and less than 1 mL of blood to run all available assays for >30 immune cell types

- No need for PBMC processing or cryopreservation

- No limitation in sample stability when frozen at -20°C

- Easy shipment on dry ice

- Works with a range of samples:
  - Whole blood (all types)
  - PBMC
  - Dried blood spots
  - Paxgene DNA/RNA blood tubes
  - Clotted blood from serum tubes
  - Fresh/frozen tissue
  - RNA keeper/RNA*later*-treated tissue
  - FFPE/paraffin embedded tissue

PRECISION
epiontisid℠

Strong Correlation With Flow Cytometry

Flow cytometry (% cells) vs Epigenetic qPCR analysis (% cells)

- ◆ Neutrophils
- ● CD3 T cells
- ▲ CD4 T cells
- ■ CD8 T cells
- ◆ NK cells
- ▲ B cells
- ● T_{regs}
- - - Regression line
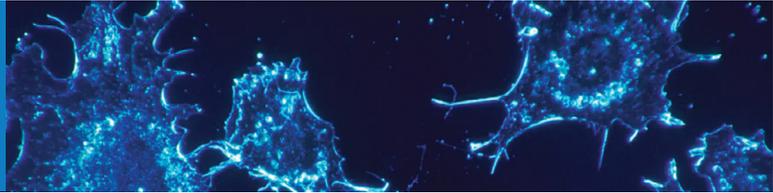- - - Bisecting line

- Nearly 70,000 samples analyzed

- >100 clinical trials

- >30 validated assays, including T, B, NK, Treg, Tfh, pDCs

Epigenetic immune monitoring by Epiontis ID is ideal for:

- Quantifying depletion/reconstitution of specific cell types, particularly when depleting antibodies have been used

- Immunophenotyping large numbers of samples

- Immune cell phenotyping within solid tissues where extraction of viable cells can be particularly challenging

- Immune cell profiling in multicentric studies, particularly when involving clinical sites in remote locations where isolation and shipment of viable cells is a significant obstacle

Cytokine Profiling

For insightful detection of immune cell secretions

ELISA

Luminex

Meso Scale Diagnostics (MSD)

Quanterix® SIMOA™

Enhance your view of the molecular events occurring within a sample to better understand disease events and therapeutic response. Precision has proven expertise in recommending and customizing the ideal assay based on sample volume, matrix, range, sensitivity, and multiplexing needs.

Comparison of cytokine profiling capabilities by instrument/assay type

	ELISA	MSD	LUMINEX	SIMOA
Sensitivity	ng/mL - pg/mL	pg/mL	pg/mL	fg/mL
Dynamic Range	2 logs	>4 logs	>4 logs	>4 logs
Multiplex Capabilities	1	10	50	6
Sample Volume	50 - 100 µL	25 µL	50 µL	1 - 100 µL
Use	All stages	All stages	Early stages	All stages

ELISpot & FluoroSpot

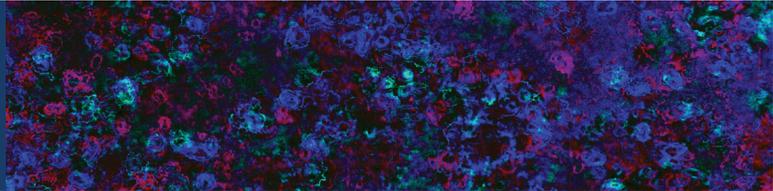## For highly sensitive, single-cell cytokine output

ELISpot

FluoroSpot

Custom In Vitro Assays

Supported globally and at every stage of clinical development, these assays provide great insight into frequency of cells expressing a cytokine of interest in response to antigen specific stimulation.

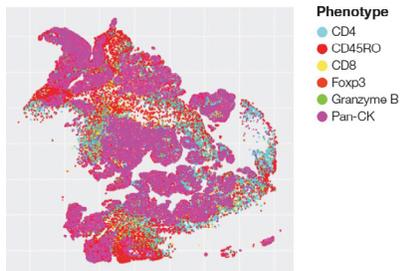## Quantitative Multiplex Immunofluorescence

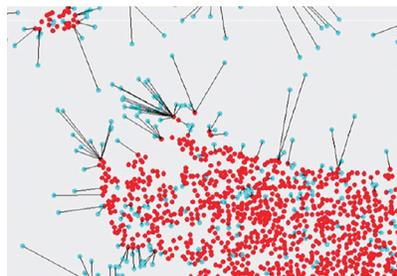# Generate complex spatial information and track dynamic change in tumors

Precision uses multiple quantitative pathology imaging systems to study spatial distribution of tumor and immune cells in tissues. This technology allows for the visualization of up to 9 markers of interest by interrogating the tumor microenvironment for immune cell activation and immune inhibitory molecules, generating actionable data that is reviewed and annotated by one of our expert pathologists.

Additionally, Precision has expertise in incorporating liquid biopsy into clinical development programs. Precision's rare cell enrichment technology, ApoStream, captures downstream differentiated immune cells, such as CAR-T cells, for immuno-oncology applications. Measure changes in checkpoint molecules, target molecules, or HLA expression in tumor cells to provide insight into immune mechanisms and potential combination therapy approaches.
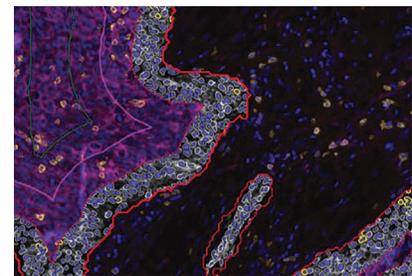
Characterize different tissue types within a sample:

Phenotype
- CD4
- CD45RO
- CD8
- Foxp3
- Granzyme B
- Pan-CK

Assess complex cell phenotypes and their spatial context:

Assess hot/cold tumor status via infiltration analysis:
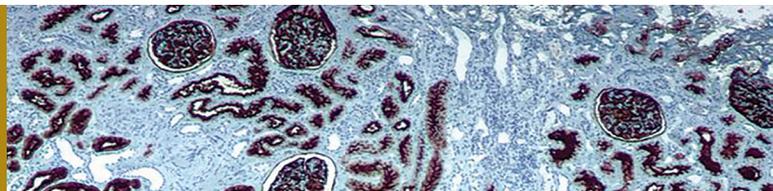

Nuclei (blue), Tumor cells (purple), CD8+ cells (yellow), Tumor margins (solid red line),

Concentric analysis regions (dotted red, purple, green lines)
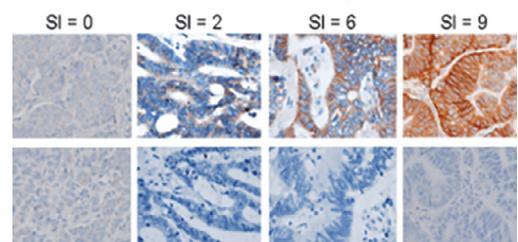
Immunohistochemistry

Visualize antigens of interest within a tissue sample

Precision has experience in developing and validating IHC biomarkers to support many key areas in our CLIA laboratory:

- Evaluate pharmacodynamic effects and therapeutic efficacy

- Patient enrollment and stratification with a 72-hour turnaround time

- Mechanism of action to further understand drug activity

- Predictive and prognostic biomarkers (eg, PDL-1)

- Monitor immune response to immunotherapies by profiling key immune cell populations

Representative images of a novel target with a customized scoring index

SI = 0   SI = 2   SI = 6   SI = 9

Precision Convergence, the Combined Power of Trials, Labs, and Data Sciences to Drive Faster Clinical Development

What sets us apart is the way we integrate clinical trial execution with deep scientific knowledge, laboratory expertise, and advanced data sciences. This is Precision Convergence: maximizing insights into patient biology and accelerating the pace of scientific discovery and approval.

trials

data

labs

For more information please visit us at:
https://www.precisionformedicine.com/specialty-lab-services/immune-monitoring/

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