Developing effective therapies rapidly, efficiently and with minimal risk is critical to the advancement of precision medicine. However, the complex and unique nature of every patient’s immune system poses challenges to achieving this goal. It is no longer sufficient to rely on the cell profiling approaches of the past.

By quickly and easily providing the highest-resolution proteomic cell profiles of any cytometry platform, mass cytometry provides the most reliable and comprehensive way to capture immune complexity. Mass cytometry generates an unrivaled, high-parameter snapshot of phenotype and function for every cell. This ability has advanced our understanding of disease and therapeutic benefit with novel insights into the function of checkpoint inhibitors, the impact of drugs on signaling pathways, tumor microenvironment biology in response to immunotherapy and the efficacy of vaccine candidates, to name only a few.

The proven reproducibility of mass cytometry, run-to-run and site-to-site, combined with the robust nature of its metal-tagged antibodies and unique barcoding technology has led to its adoption in scores of clinical and translational research studies as well as by multiple research consortia.

Now, the technology has advanced even further with automated sample acquisition and internal systems monitoring that enable hands-free, flexible operation.

**Simplify the design and execution of deep cell-profiling studies.**

**Standardize sample analysis with reproducible workflows and automation.**

**Accelerate novel therapeutic development to improve human health outcomes.**

Translating discoveries with unparalleled speed, precision and reproducibility. Explore the new capabilities of mass cytometry and imagine the science of tomorrow.
“CyTOF is really helpful because you can identify all cell subsets as well as the specific proteins that you are interested in while avoiding challenges with fluorophore spectrum overlap.”

—Hema Kothari, PhD
Research Assistant Professor
University of Virginia

“Analyzing the immune response of patients with mild-to-moderate disease, severe disease and critical disease by mass cytometry allows us to cover the innate and adaptive immune responses simultaneously.”

—Benjamin Terrier, MD, PhD
Professor of Medicine, Internal Medicine Department of Cochin Hospital

“Where I believe mass cytometry will have the highest impact is during Phase 1 and Phase 2 vaccine studies in humans by contributing invaluable information to the identification of immunological correlates of protection.”

—Marcelo Sztein, MD
Associate Director for Basic and Translational Research, Center for Vaccine Development and Global Health
University of Maryland School of Medicine
Since every second counts in disease diagnosis, the ability to maximize insights into patient biology and successfully execute comprehensive studies could deliver the most value. The proven reliability, reproducibility and clarity of mass cytometry simplify complex study design and ease site-to-site coordination challenges. By removing these barriers, the technology expedites timelines and accelerates the pace of scientific discovery and study completion. Broad adoption of mass cytometry speaks to the confidence it has inspired for cost-effective clinical study management across sites.

CyTOF XT provides easily scalable solutions that address key hurdles when conducting sophisticated clinical research programs.

“CyTOF mass cytometry was selected for assessing function and phenotypes of immune-cell subsets … as it was considered advantageous over flow cytometry for the higher number of biomarkers detected by antibody panels, with little or no spillover between detector channels.”

Since its commercialization, mass cytometry has revolutionized the cell biology world. Liberated from autofluorescence and fluorescence spillover, mass cytometry simplifies and expands exploration into cellular behavior.

The rapidly evolving environment of clinical and translational research is complex and demanding. Meet these challenges head-on using CyTOF XT to accelerate the path to answers through better agility, customization and execution.

CyTOF XT enables simplified and superior cell profiling, empowering practical biomarker-driven clinical research solutions that can optimize and personalize disease management. With hands-free sample acquisition, easier operational workflows and reduced cost of installation and ownership, CyTOF XT leads as an ideal platform for a variety of research applications.

Mass cytometry uses stable metal isotope tags to label cellular targets for precise detection in 125 distinct channels. More than 50 isotopes can be simultaneously measured per tube of cell sample. CyTOF technology overcomes the limitations of fluorescence-based detection modalities by separating signals based on differences in mass instead of wavelength. This powerful single-detector system with straightforward signal path from ionization to detection results in negligible background and minimal signal overlap.

By incorporating mass spectrometry, CyTOF technology powers mass cytometry to quickly provide a high-resolution proteomic profile of each cell, giving a more comprehensive functional and phenotypic view of complex systems from a single tube of precious patient sample.
Mass cytometry brings a combination of speed, precision and reproducibility to cell analysis not enabled by other single-cell platforms.

CyTOF XT further enhances the capabilities of mass cytometry with workflow automation that refines sample processing and data acquisition.

The instrument offers a new level of autonomy through streamlined operation, automatic monitoring and easier system management, altogether resulting in superior data quality. So you can focus on what matters most.

Adoption of mass cytometry for use in clinical and translational research is rising steadily, year on year.

**MULTIPLE RESEARCH CONSORTIA**

OVER 60% OF US COMPREHENSIVE CANCER CENTERS

OVER 150 CLINICAL TRIALS USING MASS CYTOMETRY

OVER 1,300 PEER-REVIEWED PUBLICATIONS

CyTOF XT is the most technologically advanced mass cytometer to date, designed to build on the benefits of CyTOF technology while simplifying operation and automating sample acquisition for the best reproducibility and time to results from every run.

The power of mass cytometry to perform 50-plus-marker high-parameter analysis on a single tube of sample has created a new standard of expectations—that more can always be discovered if you have the right tools.

**THINK YOU KNOW CYTOF? THINK AGAIN.**

**XTra Autonomy**

Walk away from sample loading, acquisition and monitoring. Do more with your time.

**XTra Efficiency**

With easy setup and automated system optimization, enjoy peak performance from minimal input.

**XTra Clarity**

Achieve unrivaled quality and depth of understanding from a greater selection of markers.

**XTra Insight**

Simpler cell profiling with standardized workflows to accelerate therapeutic development.

**Ignite your research. CyTOF XT**

With a simpler approach and cutting-edge technology, move beyond ordinary to XTraordinary.

**SIMPPLY. STANDARDIZE. ACCELERATE.**

Ignite your research.

CyTOF XT

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**SIMPPLY. STANDARDIZE. ACCELERATE.**

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With a simpler approach and cutting-edge technology, move beyond ordinary to XTraordinary.
Clinical and translational researchers have embraced the power of CyTOF technology to uncover biological insights. CyTOF XT helps you surpass current processes by streamlining and accelerating your approach to efficiently conducting clinical research studies.

**XTRA AUTONOMY**

**CHILLED SAMPLE CAROUSEL**

**WALK-AWAY ACQUISITION**

**AUTOMATED CLOG SENSING**

Innovations in CyTOF XT automation expand the possibilities of what your lab can accomplish. The chilled carousel of the Autosampler preserves cell integrity while samples are held for their run. The system automatically resuspends pelleted samples and adds internal standardization beads for improved data quality.

Automated, walk-away sample acquisition can greatly improve reproducibility by minimizing manual error. The automated clog sensing feature of CyTOF XT provides peace of mind and confidence in results, knowing the instrument self-monitors potential issues and addresses them before they occur.

**SIMPLE SAMPLE PREP**

Consistency of data is key, whether working to prove a hypothesis or standardize a clinical study protocol. The automation and system optimization of CyTOF XT deliver consistent, high-quality data for multiple samples at a time to help fast-track extensive studies.

**WHAT IF ... you could calibrate once for numerous different samples and panels, and run hands-free for hours?**
FASTER BY DESIGN, CYTOF XT SIGNIFICANTLY REDUCES SETUP TIME FOR MORE EFFICIENT SAMPLE PROCESSING AND SHORTER TIME TO RESULTS.

The simplified front-end assembly, bottle tray for solutions and automated tuning minimize maintenance and calibration. Instrument optimization with EQ Calibration Beads requires just one reagent to calibrate and optimize the system for any panel.

With the benefit of hands-free operation, mass cytometry with CyTOF XT provides unparalleled efficiency for quality and timely outcomes by incorporating sample sizes of thousands to millions of cells and walkup sample addition for added flexibility.

EASY DAILY SETUP
AUTOMATED SYSTEM TUNING
REAL-TIME SIGNAL OPTIMIZATION

IMAGINE IF ... your high-parameter cytometer needed only one daily optimization, applicable to every experiment and maintained automatically.

WHAT IF ... your high-parameter data is ready for analysis immediately after acquisition?

OPTIMIZE YOUR RESEARCH
CyTOF XT real-time signal optimization stabilizes the detection system for long acquisitions, especially important for multiplexed samples. Variability from acquisition is minimized, and data is processed to FCS files and is ready for analysis right after acquisition with no special data transformations needed.
The precision of measuring marker expression using mass cytometry is unmatched by fluorescence cytometry methods. Consequently, more accurate data is collected from cleaner signals.

In mass cytometry, there are no complicated algorithms to apply to deconvolute or compensate for spectral overlap. This equates to less chance of error and data misinterpretation, no need for extra control tubes of sample and far easier 50-plus-marker panel creation and modification.

As a result, mass cytometry is being applied to the broadest range of applications, spanning analysis not only of phenotypic markers but signaling and transcriptional protein expression, deep profiling of T and B cell repertoires including antigen-specificity, and epigenetic changes.

WHAT IF ... you could design and validate a high-parameter panel in days, not weeks? And then easily add markers to modify that panel without heading back to the drawing board?
THE MAXPAR DIRECT IMMUNE PROFILING ASSAY

Gain even more by using the Maxpar® Direct™ Immune Profiling Assay™ on CyTOF XT. The combination of a single-tube workflow with automated multiple sample processing enables a greater level of efficiency, unmatched in conventional protocols.

The standardized assay can be harmonized across sites for high-dimensional immune profiling of human PBMC and whole blood, providing the broadest single-tube view of the immune system from each precious sample. Run the assay seamlessly across numerous samples unattended by relying on CyTOF XT for automated sample processing and acquisition.

Extend your view and the possibilities with an easily expandable marker base panel and 5-minute data analysis. Simply count 37 immune cell populations with performance you can trust.

30 MARKERS.

5 MINUTES.

1 TUBE.
WE’VE GOT YOU COVERED WITH FLUIDIGM PRO SERVICES

A critical success factor when adopting high-performance technology is acquiring the proficiency and support to accelerate your research and discovery initiatives. Fluidigm PRO Services are a comprehensive portfolio of solutions to help you maximize your investment, scale up productivity and empower your laboratory with greater access to professional resources.

**Laboratory Optimization**
Enhance operational efficiency and productivity. Customized services from our diverse team of experts help you prepare for technology adoption, streamline workflow and support continuous improvement initiatives.

**Scientific Consultation**
Accelerate your research with expert applications support. Consultative services include experimental and panel design, workflow setup, application troubleshooting and optimization and data analysis.

**Product Care**
Maximize your investment and system performance. Our global network of trained experts provides timely support, training programs, compliance services, proactive maintenance and repair services to optimize productivity and performance of your systems.

**Custom Services**
Leverage tailored services to achieve unique research goals. Our expert Therapeutic Insights Services team will customize, manage and execute your project from sample to answer, helping to deliver insights from high-dimensional single-cell data.

Providing expertise to power insights
Mass cytometry offers an ideal, affordable solution for the routine characterization of target cell populations, with easier panel design and standardized instrument setup to deliver trusted results. CyTOF XT adds an additional layer of efficiency, simplicity and autonomy to truly clarify our understanding of biological systems and clinical outcomes.

Whether your goal is to gain greater knowledge of disease progression, discover more predictive or prognostic biomarker signatures or simplify the path of therapeutic development from bench to bedside, Fluidigm is committed to enabling you to improve the human condition. Join the growing mass cytometry community to further your research and imagine what CyTOF XT can do for you.

Ask for a visit from your local representative to find out more about how CyTOF XT can help you achieve your research goals. Visit fluidigm.com to see current publications, read interviews with our users, watch videos and learn more about mass cytometry.

WHAT IF ... you could employ affordable, cutting-edge technology, accelerating your research beyond what’s currently possible?

YOU CAN. The new CyTOF XT—the next evolution in mass cytometry for translational and clinical research is here. Contact us: fluidigm.com/cytof.xt