

Cocktail.
Stain.
Wash.
No Centrifuge
No Scripting

One station. Fully automated. Your SOP. Your panels.

THE WORKSTATION
C-FREE™ Pluto Workstation





72

antibodies.
Zero centrifugation.

Per cocktailing run on a Pluto Workstation.
Up to 45 end-to-end cocktail, stain, and wash.

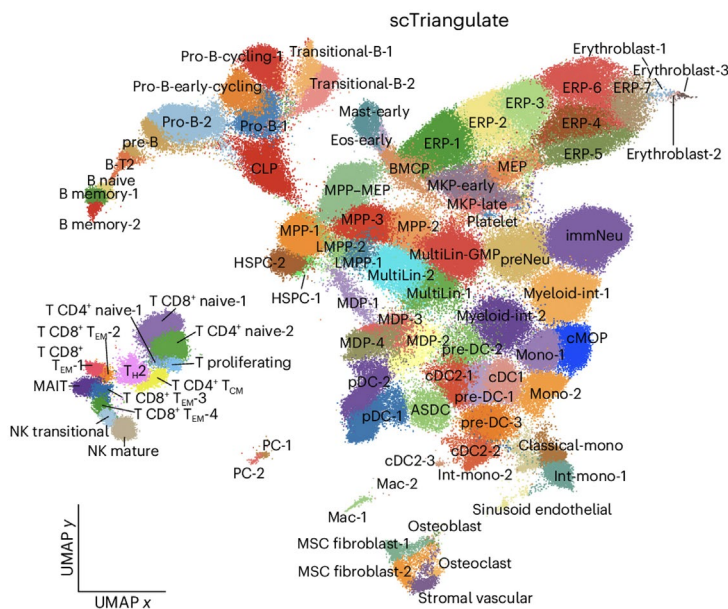
THE CHALLENGE

Flow cytometry scaled. Sample prep didn't — until now.

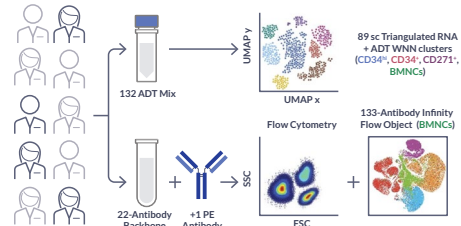
Flow cytometry has advanced — more colors, more markers, more sites, and more data per sample than ever before. Manual sample preparation isn't efficient at this scale. But switching to automation can feel like a project in itself. That's why we built a sample preparation system that's end-to-end, compact, and easy to set up.

89 Populations · 133 Markers

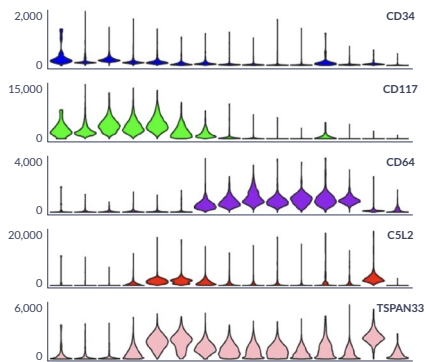
A.



B.



C.



Data from Cincinnati Children's Hospital Medical Center demonstrated that C-FREE™ wash technology enabled rigorous antibody titration and resolving **133 markers** across primary human bone marrow samples — defining **89 distinct cell populations** spanning stem cells to stromal cells across varying sex and race.

“ *An immunophenotype-coupled transcriptomic atlas of human hematopoietic progenitors.* **Zhang et al.** Nat. Immunol. 25, 703 (2024).

THE SOLUTION

One instrument. Antibody cocktailing to flow-ready sample.

C-FREE™ Pluto is the first instrument to automate the complete sample prep workflow — from antibody cocktailing through staining and centrifuge-free washing — on one compact instrument. No scripting. No complex setup. No centrifuge. Just reproducible results, every run.

Available in multiple configurations up to 96-well throughput*, for small-scale labs or multi-site organizations standardizing across sites.

KEY HIGHLIGHTS

SETUP

20 min hands-on time

per panel, vs. 2.5–3.5 hrs manual

SCALE

72 antibodies

per cocktailing run;
45 cocktail → stain → wash

CENTRIFUGE-FREE

22% debris reduction

with C-FREE™ centrifuge-free washing (page 8)

TIME SAVING

250 min

hands-free per run (Stanford HIMC).

DATA

Cleaner populations

from fewer prep artifacts



This centrifuge-free workflow allows us to scale and generate reproducible data across larger datasets. We can spend more time analyzing the data and thinking about experimental design, while leaving the execution to automation.

Bernd Wollscheid

Professor, ETH Zürich

Data generated on Pluto Code integrated with an automated liquid handling platform.

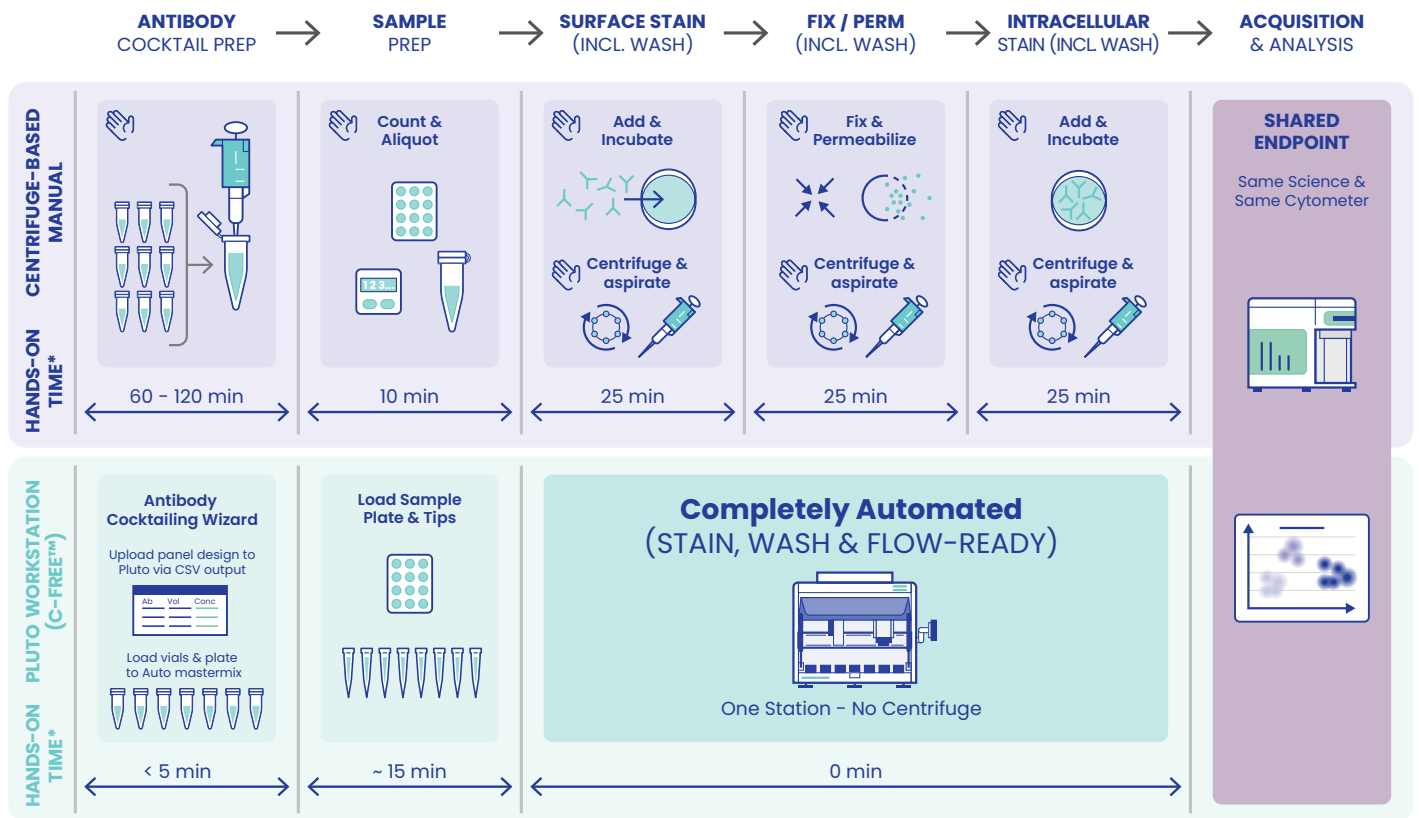
* Pluto HT 384-well capacity available 2H 2026 — equivalent to four 96-well plates in a single run.

The same workflow. Without the centrifuge.

C-FREE™ Pluto runs every stage of flow cytometry sample preparation on a single deck – from antibody master mix preparation through centrifuge-free wash, with on-board fixation and permeabilization for intracellular staining workflows.

C-FREE™ technology replaces the centrifuge step with software-controlled, pipette-based flow that performs buffer exchange directly in plate. No off-board cycles. No plate transfers between instruments. No user-to-user drift across sites or runs.

Manual vs C-FREE™ Pluto Workflow Comparison



MANUAL — vs — **PLUTO**
~2.5–3.5 hrs / ~20 min

REDUCTION OF
~90%
in hands-on time

ELIMINATED
Centrifuge
at every wash

Representative workflow: PBMC sample, custom 20+ marker ICS panel. Based on published flow cytometry protocols (Thermo Fisher, BioLegend, R&D Systems, and Abcam) and Curiox internal benchmarking.

FITS YOUR WORKFLOW

Your SOP. Your panels. Your bench. Automated.

C-FREE™ Pluto fits into the workflow you already run — same protocol, same antibodies, same bench, same team. Setup takes minutes, and every run is logged.

- **Keep your protocol** — load your SOP once; C-FREE™ Pluto runs it exactly as written. No scripting.
- **Keep your bench** — compact benchtop footprint, standard power. No facilities buildout, no robotic arm.
- **Trust every run** — every step timestamped and exportable. Plate maps, deck layouts, per-well event logs captured automatically.
- **Keep your antibodies** — up to 72 antibodies per cocktailing run, 45 end-to-end. All common vial types. Imports from your LIMS.
- **Keep your team** — biologist-operated; the SOP-driven UI is familiar to anyone who's written an SOP.
- **Standardize across sites** — same SOP, same instrument behavior, run-to-run reproducibility across sites.

Why this matters

- **Centrifuge-free** — 47.4% debris with C-FREE™ vs. 61% conventional.
- **Per-assay setup, not per-system** — new panels load as a table. No engineer visit, no platform revalidation between panels.
- **Hands-free** — up to 250 min walk-away time per run (Stanford HIMC).
- **Infrastructure** — benchtop only. No facilities project. Standard power.



Standardizing high-parameter flow cytometry workflows has been a persistent challenge in research immunology. The Workflow Wizard addresses this directly: our team can load an existing staining and washing protocol as a table, and the Pluto Workstation executes every step without manual intervention. That combination of immediate usability and run-to-run reproducibility is what makes it a serious tool for high-throughput immune monitoring environments.

Holden Maecker, PhD

Director, Human Immune Monitoring Center, Stanford University, Scientific Advisor, Curiox Biosystems

THE SOFTWARE

Software-guided setup for your protocols and your panels.

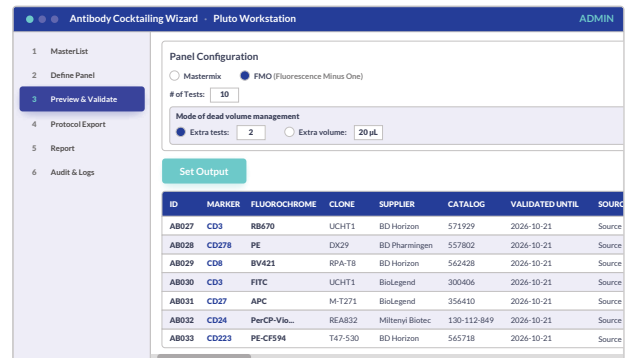
Two intuitive software modules guide you to input your lab's existing antibody panel table and staining SOP – allowing full end-to-end automation of your optimized SOPs.

Antibody Cocktailing Wizard

Automated antibody vials → master mix and controls

Automates cocktail preparation from your antibody inventory.

- Supports up to 72 antibodies per cocktail run.
- FMOs and SCCs prepared automatically.
- Liquid Level Detection (LLD) for accurate aspiration and rare-reagent protection.
- Use your existing antibody vials – any common vial type, no transfers required.
- Import antibody inventory directly from your LIMS.

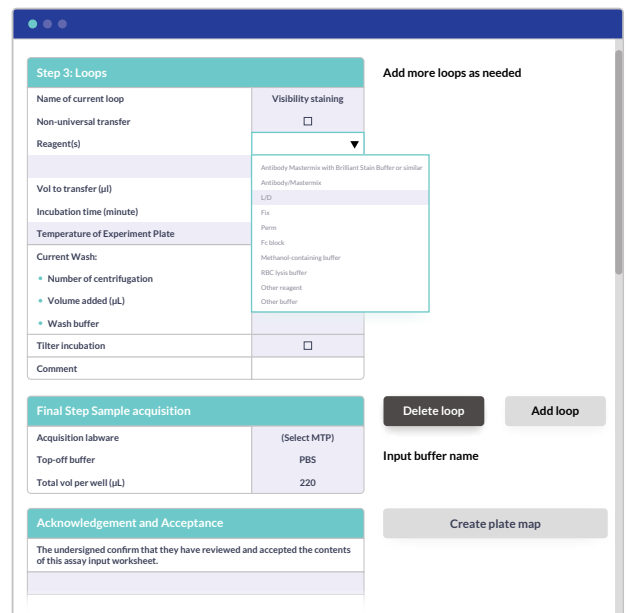


Workflow Wizard

Stain + wash → flow-ready cells

Orchestrates the complete staining and washing sequence.

- Input your existing protocol in familiar tables – no scripting.
- Every step and incubation time executed as written.
- Auto-generated plate maps and deck layouts.
- Run-ready protocol generation; FMO/SCC automation propagates from ACW.
- Audit-ready run log – every step timestamped and exportable.



THE DATA

Trusted by Stanford, NIST Flow Standards Consortium and Top Biopharma Organizations.

Manual data is the benchmark. Pluto matches or exceeds it – across panel size, donors, and sites.

Figure 1. Stain Index, Stanford HIMC

C-FREE™ Pluto matches or exceeds manual sample prep on stain index across a 24-color panel – five donors.

- **Consistent staining quality** – Stanford’s HIMC imported their manual protocol onto Pluto exactly as written. Stain index and population separation matched or exceeded manual prep across the 24-color panel.
- **Time savings** – Hands-on time drops from ~90 min to ~15 min per cocktail run, with up to 250 min of walk-away time across a full HIMC staining run.

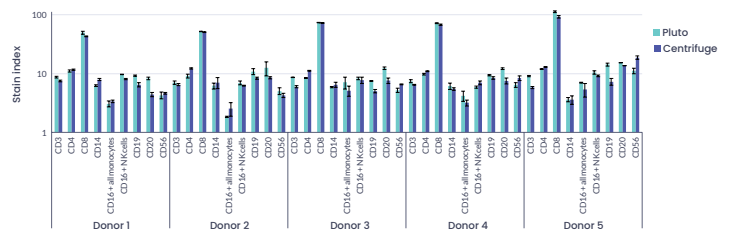
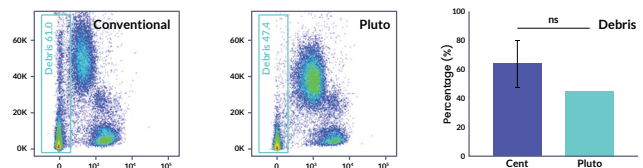


Figure 2. Debris After Wash

C-FREE™ wash reduces debris from 61% to 47.4% vs. conventional centrifugation.

- In a head-to-head using a lysed whole-blood staining panel, Pluto ran the complete workflow – cocktailing, staining, washing, and fixation – on one instrument. Pluto produced cleaner samples without compromising cell quality.



We had automation for antibody cocktailing and data transfer, but washing was always the missing link. We were still carrying plates between disparate instruments, centrifuging, flicking, and resetting the workflow. Pluto finally closed that gap and integrated the full process.

Ryan Duggan
Senior Scientist, AbbVie

The only automated sample-prep platform in the FCSC cross-site reproducibility study
Pluto participates alongside manual preparation methods used across the consortium’s sites.

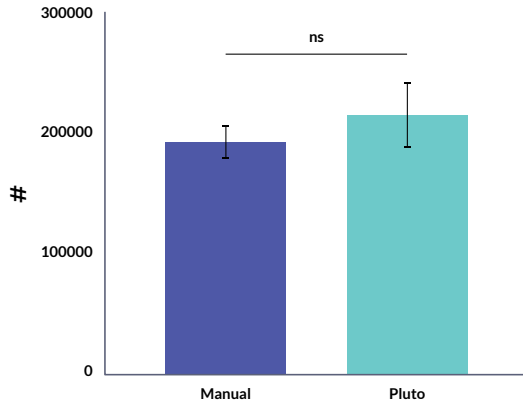
Dr. Lili Wang (NIST)

NIST FCSC Interlaboratory Study Presented at CYTO June 6, 2026

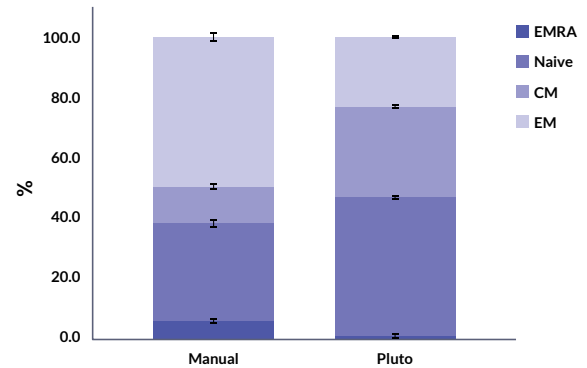
Figure 3. T-cell Population Discrimination

C-FREE™ Pluto maintains T-cell population discrimination with select differences in memory subset frequencies and stain index compared to manual method.

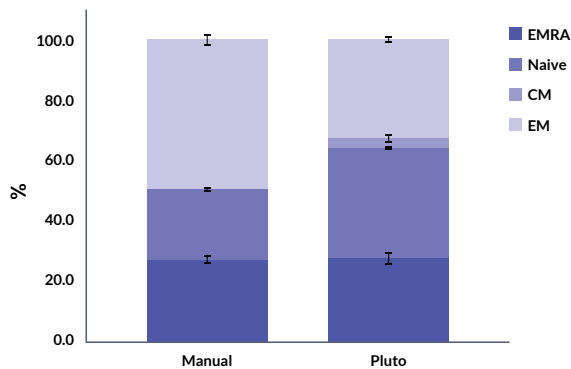
A. Retention of CD45+ Cells



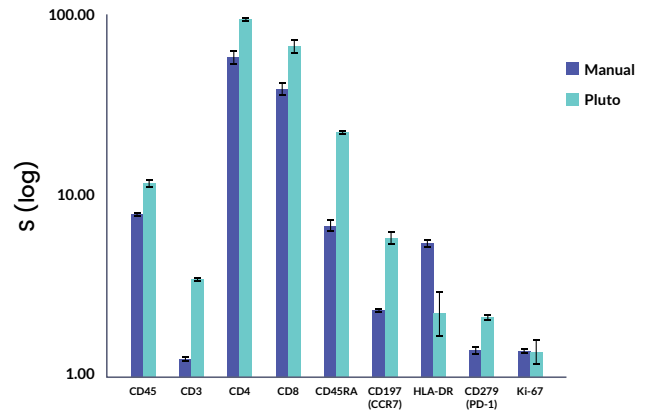
B. CD4+ T-cell Subsets



C. CD8+ T-cell Subsets



D. Stain Index of Cell Markers



C-FREE™ Pluto preserves immune cell populations with performance equivalent to manual centrifugation. Absolute CD45+ cell retention with Pluto falls within $\pm 20\%$ of the manual method, with no statistically significant difference by Student's t-test ($p < 0.05$ threshold; $n = 2$ technical replicates, one healthy donor). T-cell memory subset frequencies – EMRA, naïve, central memory, and effector memory – within both CD4+ and CD8+ compartments were comparable between methods; observed differences are consistent with improved gate boundary resolution on Pluto rather than biological variation. Stain index across the panel was maintained or improved: Ki-67 was within $\pm 20\%$ of manual, HLA-DR showed a non-significant reduction, and the remaining markers were higher with Pluto.

C-FREE™ Pluto

End-to-end workstations.

Cocktail → Stain → Wash on a single deck. Three throughput tiers, one centrifuge-free workflow.

Cocktail → Stain → Wash

System	Throughput	Best For
Pluto LT Workstation	Low (8–32 wells)	Compact, full end-to-end workstation for lean teams and method-development labs.
Pluto MT Workstation	Mid (24–72 wells)	The everyday Pluto: end-to-end automation for routine immunophenotyping and core-facility throughput.
Pluto HT Workstation	High (96 wells*)	Highest-capacity Pluto for high-volume biopharma, CROs, and multi-site programs.

The Workstations

Pluto LT
Low · 8–32 wells



Pluto MT
Mid · 24–72 wells



Pluto HT
High · 96 wells



All three Workstations share the same C-FREE™ plate, reagents, and software – methods written on one tier port directly to the next.

*Pluto HT 384-well capacity available 2H 2026 – equivalent to four 96-well plates in a single run.

Wash-only C-FREE™ for existing pipelines.

Already have a liquid handler or a dedicated cocktailing setup? Drop C-FREE™ in — keep the rest of your workflow exactly as it is.

Wash only

System	Throughput	Best For
Pluto ALPHA	High (96 wells)	Compact, low-maintenance dedicated C-FREE™ washer — gentle, reproducible washing for suspension cells and beads.
Pluto Code script library*	High (96 / 384 wells)	Unlock C-FREE™ washing on your existing liquid handler. Validated with Hamilton, Tecan, Beckman Coulter (Biomek), and Opentrons.*

The Dedicated Washer

Pluto ALPHA
96 Wells



Dedicated C-FREE™ Washer

A compact, low-maintenance washer for suspension cells and beads — gentle, reproducible, and built around the same C-FREE™ exchange that powers every Pluto Workstation.

*Pluto Code compatibility confirmed by Curiox Biosystems. Not affiliated with or endorsed by the platform manufacturers. All trademarks property of their respective owners. Confirm your specific platform with our team.

GET STARTED

Ready to see C-FREE™ Pluto run your SOP?

01

**Schedule
a Demo**



curiox.com/pluto

02

**Get the
Data**



See the Stanford poster
on multicolor panels

curiox.com/data

03

**Talk to an
Automation Specialist**



curiox.com/contact

Biology at its best.

