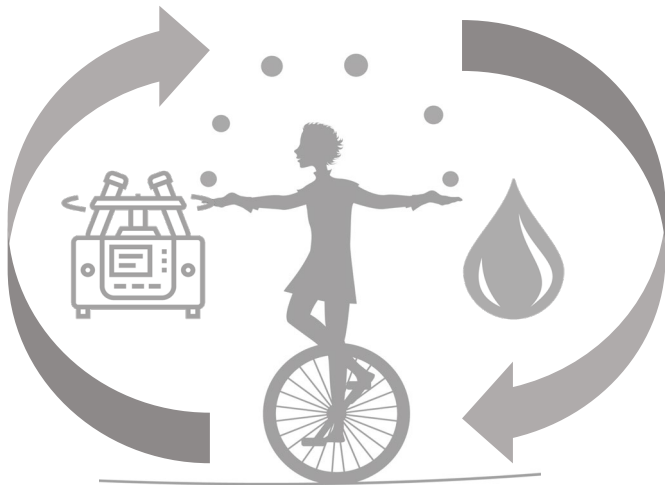


# Biology at its Best

Centrifuge free immuno-staining of cell samples.  
Because great data starts with great sample.

Centrifuge/Washer Combo



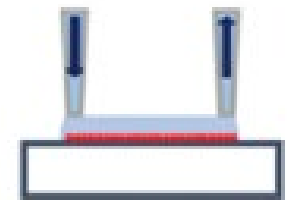
Go Centrifuge Free

Laminar Wash™



- ✓ Easier Workflow.
- ✓ Superior Viability.
- ✓ Better Recovery.
- ✓ Cleaner Data.

1. Mix and stain
2. Laminar wash them

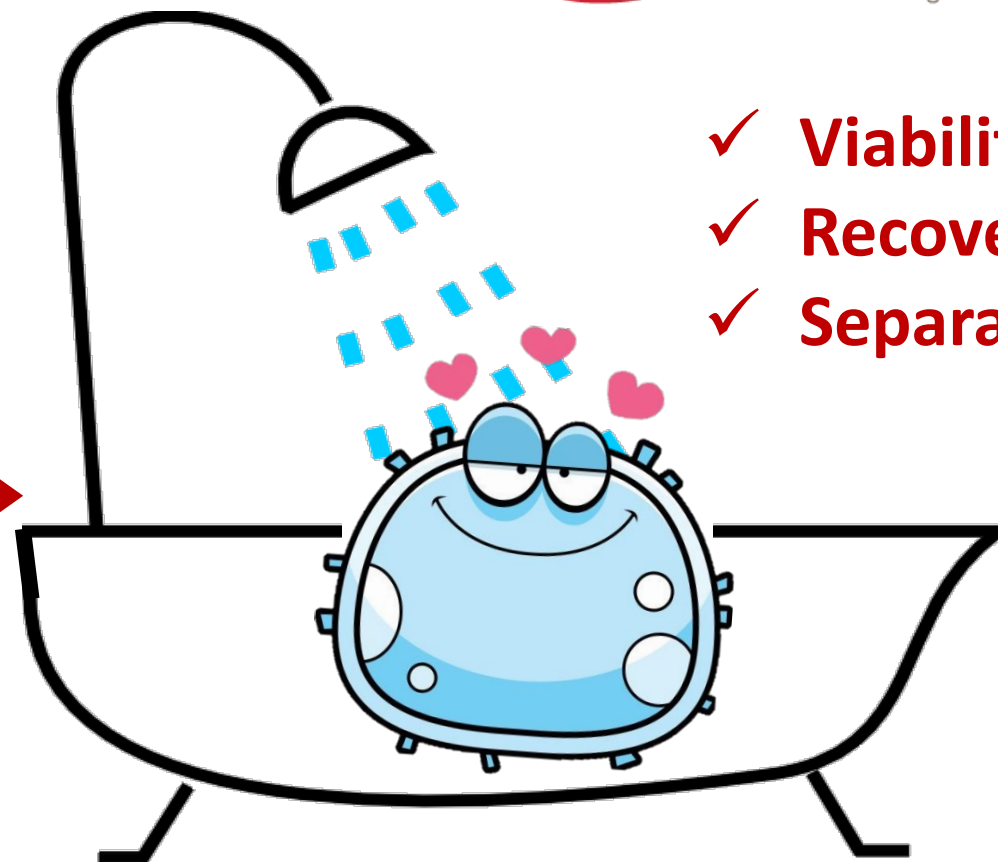
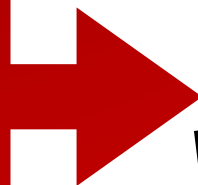


*“Centrifuge  
getting biology  
in a spin”...*



**Stress  
Cell Loss  
Debris...**

**Go Centrifuge Free**



- ✓ **Viability**
- ✓ **Recovery**
- ✓ **Separation**

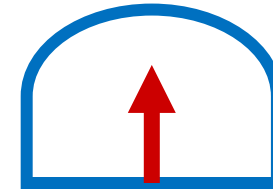
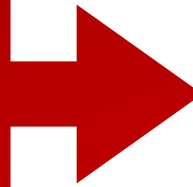
**Laminar Wash™  
Loved Cells**



*“Centrifuge workflows can be a multistep challenge”...*

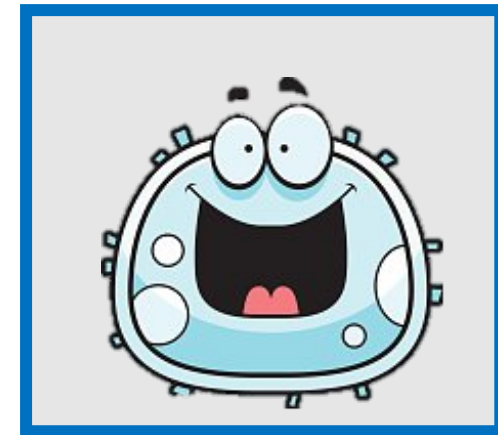
**20  
Steps?**

**Go Centrifuge Free**



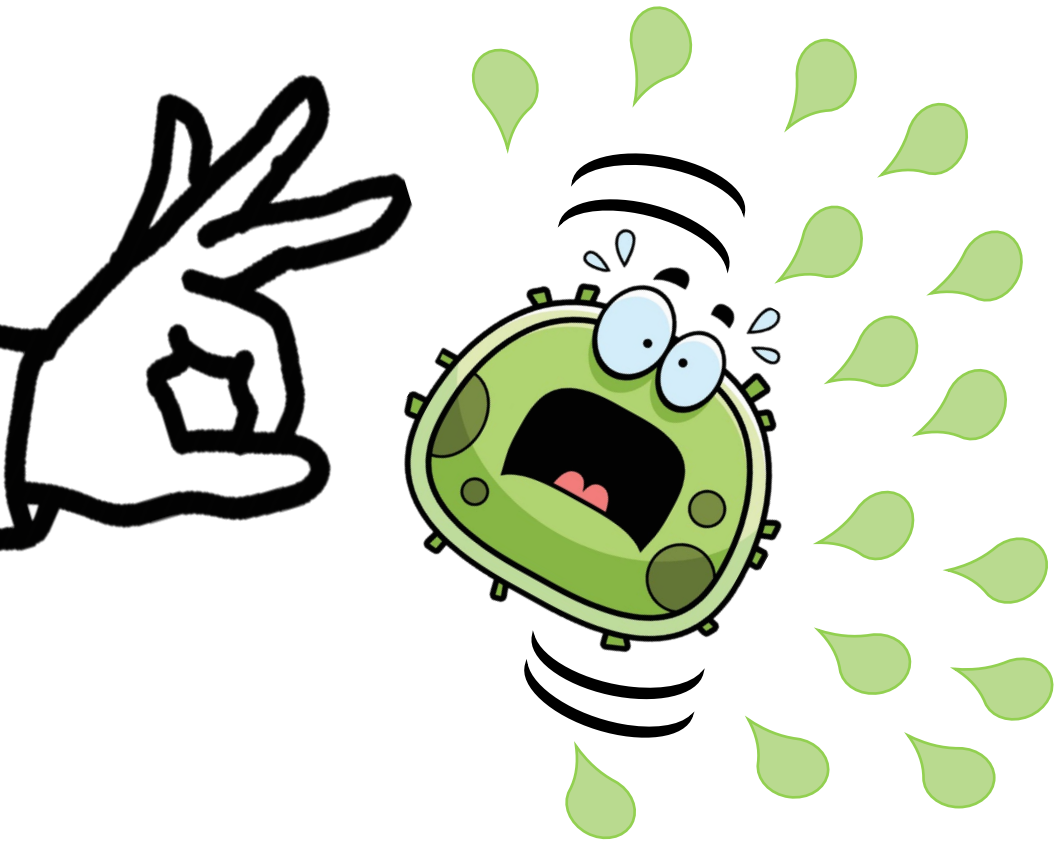
**2-3 min for  
7 washes**

**2-step-elevator**

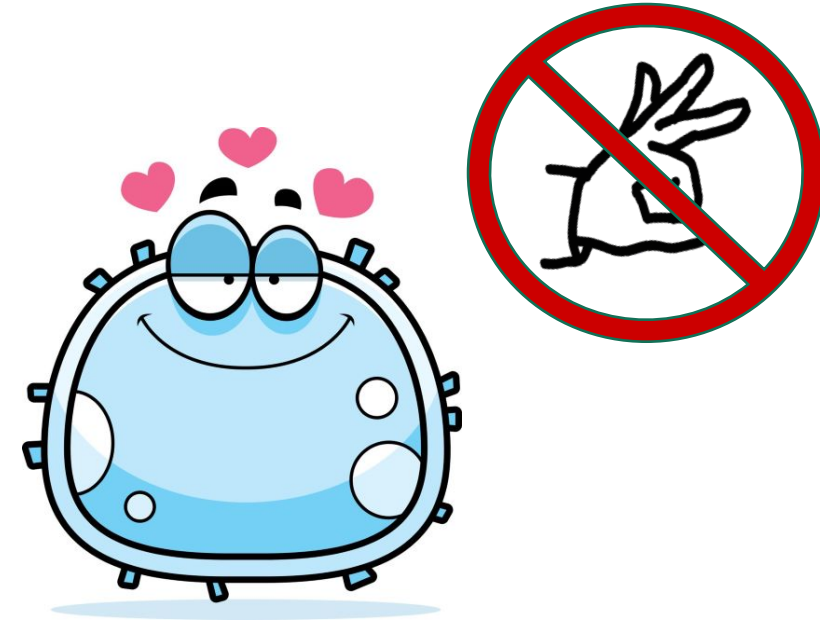
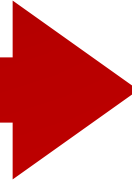


**1: Mix and Stain  
2: Laminar Wash them!**

# Centrifuge workflow introduces Plate-Flick-Variation.

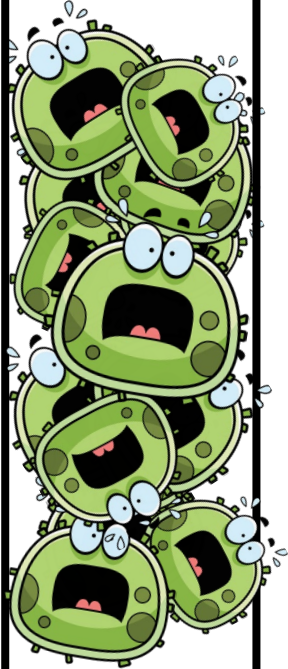


Go Centrifuge Free



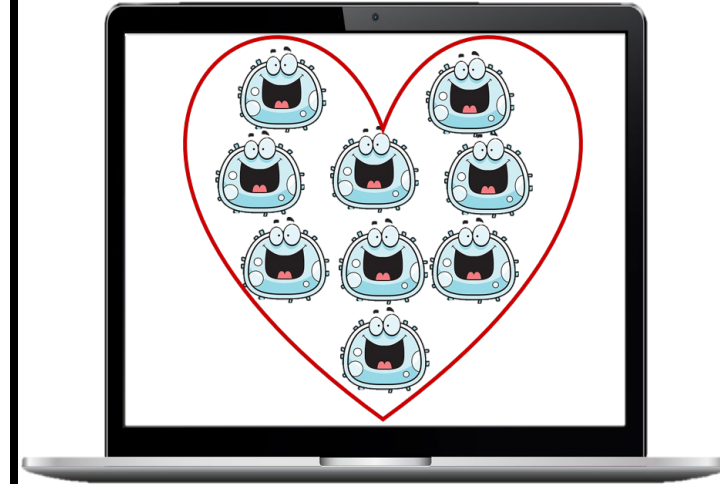
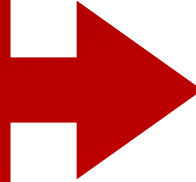
## Flick-Free-Happy

Laminar Wash™  
Loved Cells



*“Centrifuge =  
**Pelleted sample,  
debris, clumping and  
clogging** can mean  
another call to the  
Flow Doctor”...*

**Go Centrifuge Free**

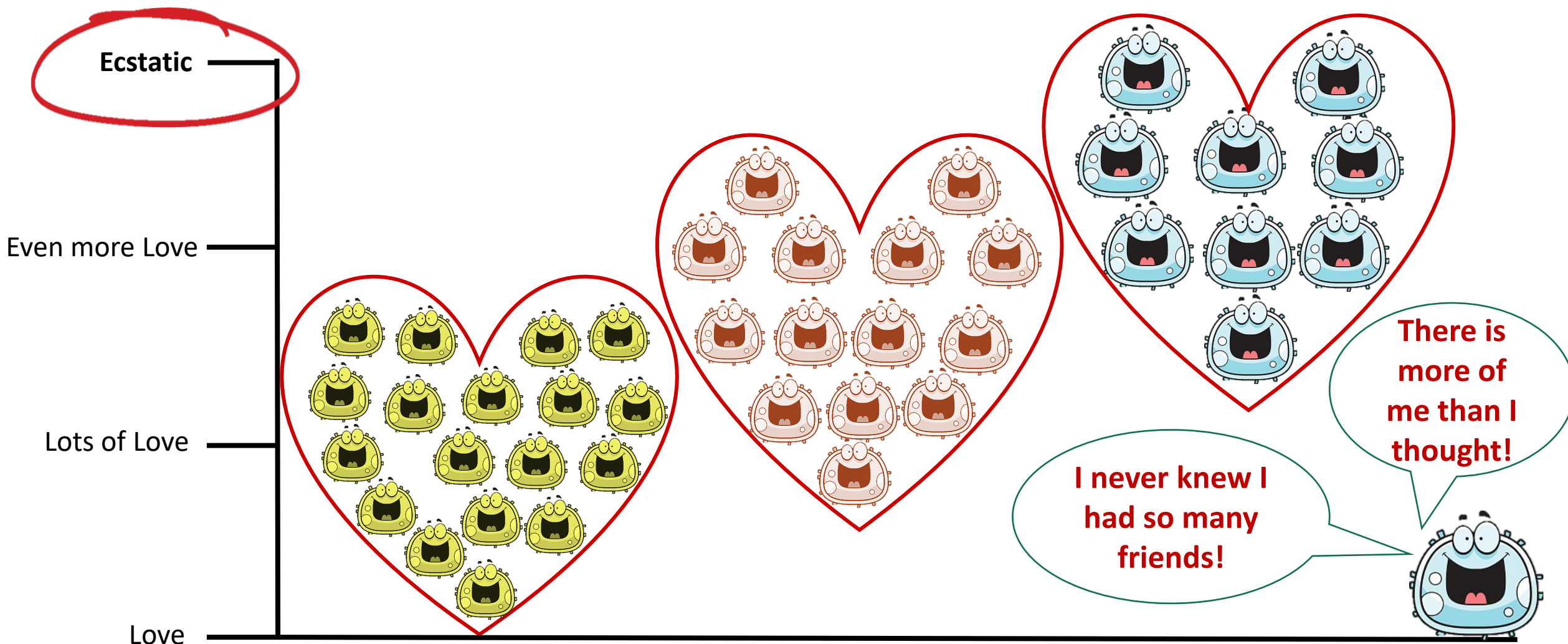


**Laminar Wash™  
Loved Cells**



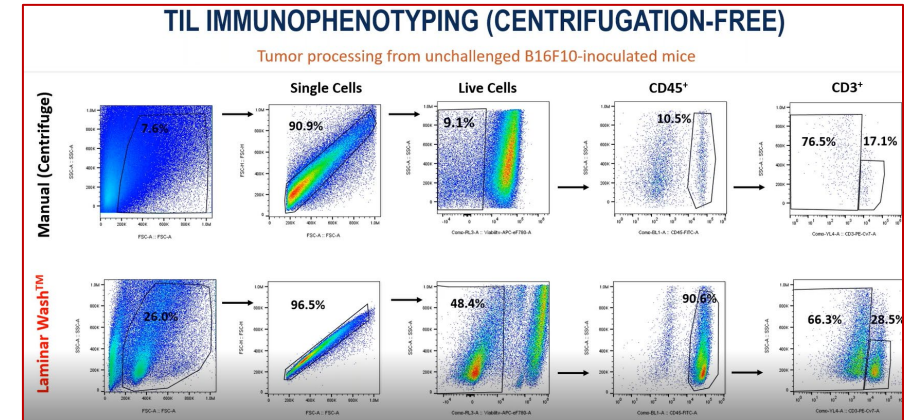
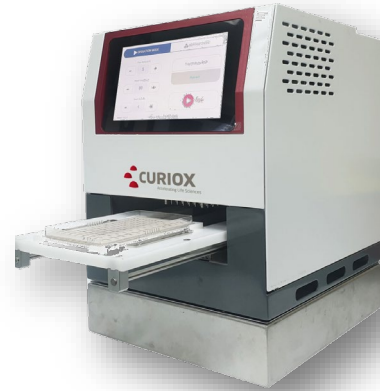
# Laminar Wash™ loved cells

## Love to gate!



## Example benefits of using the Laminar Wash™ as seen by:

- ✓ Improve **workflow**.
- ✓ Increase **reproducibility**.
- ✓ Increase **consistency**.
- ✓ Increase **cell retention**.
- ✓ Increase **cell viability**.
- ✓ Increase **resolution** of cell populations.
  
- ✓ Reduce **stress** on sample.
- ✓ Reduce **debris** and autofluorescence.
- ✓ Reduce **clumping** and cytometer clogging.
- ✓ Enable **lower** single cell suspension volumes.
- ✓ Support **3Rs** commitment reducing sample volumes.



**Dr Christoph Eberle**  
Discovery Oncology  
charles river



Picture courtesy of Thermo Fisher

Go Centrifuge Free

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TECHNICAL NOTE



Development of a 43 color panel for the characterization of conventional and unconventional T-cell subsets, B cells, NK cells, monocytes, dendritic cells, and innate lymphoid cells using spectral flow cytometry

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Abstract

Although many flow cytometers can analyze 30–50 parameters, it is still difficult to develop a 40+ color panel for the phenotyping of immune cells using fluorochrome-labeled antibodies due to limitations in the availability of spectrally unique fluorochromes that can be excited by the commonly used laser lines (UV, Violet, Blue, Green, and Red). Spectral flow cytometry is capable of differentiating fluorochromes with significant overlap in the emission spectra, enabling the use of spectrally overlapping fluorochrome pairs such as Brilliant Blue 515 and FITC in a single panel. We have developed a 43 color panel to characterize most of the immune subsets within the peripheral blood system, including conventional T cells, unconventional T cells such as invariant natural killer T cells (iNKT), Gamma delta ( $\gamma\delta$ ) T-cell subsets (TCR  $\gamma\delta$ , TCR  $\alpha\beta$  associated invariant T cells (MAIT), B-cell subsets, natural killer cells, dendritic cells, dendritic cell subsets, hematopoietic progenitor cells, and innate lymphoid cell (ILC) subsets (CD117, CRTH2). The panel includes surface markers for T cell activation (CD38, HLA-DR, ICOS/CD278), differentiation (CD45RA, CD45RO, CD57), expression of cytokine and chemokine receptors (CD25, CD127, CD122, CCR4, CXCR3, CXCR5, CRTH2/CD294), and co-inhibitory molecules and receptors (PD-1, CD223/LAG-3, TIGIT), which enables a deep characterization of PBMCs in peripheral blood. Cells were analyzed on a 5-laser Cytex Aurora and data analysis was done using FlowJo. This panel can help to make a thorough interpretation of immune system, specifically when specimen quantity is low. The panel has not been completely optimized but would rather act as a guide toward the development of a workflow for optimized multicolor immunophenotyping panel.

**KEYWORDS**  
 dendritic cells, innate lymphoid cells, immunophenotyping, spectral flow cytometry, unconventional T cells



Flow Cytometry Staining Procedure

Manual Centrifugation	Stain with Zombie Aqua	Laminar Wash™
~10 minutes per round		2 minutes
~10 minutes per round		2 minutes
~10 minutes per round		2 minutes
Wash (2x)		2 minutes
↓		
Fix and Acquire		
at least 60 minutes	Total Time Spent Washing	6 minutes

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TotalSeq™ -A Antibodies and Cell Hashing with 10x Single Cell 3' Reagent Kit v3 or v3.1 Protocol

This is an updated version of our TotalSeq™-A antibodies and cell hashing with 10x Single Cell 3' Reagent Kit v3.1 protocol. For specific changes, please see the [change log](#) at the bottom of the protocol.

*Buyer is solely responsible for determining whether Buyer has all intellectual property rights that are necessary for Buyer's intended uses of the BioLegend TotalSeq™ product. For example, for any technology platform Buyer uses with TotalSeq™, it is Buyer's sole responsibility to determine whether it has all necessary third-party intellectual property that platform and TotalSeq™ with that platform.*



# Curiox improve sample prep with a range of Laminar Wash Products



## LW MINI1000

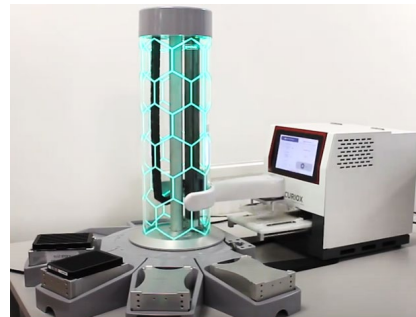
- 8 wells throughput from 16-well strip
- Automate washing of cells



## LW HT2000

(shown with buffer exchanger)

- 96 well throughput
- Automate washing of cells



## LW AUTO1000

- Automate the entire cell prep from start to finish, in multiple plates
- Ready out of box
- Protocol wizard: No scripting necessary

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