



A Comparison of 37+ Immune Populations in Whole Blood by CyTOF Flow Cytometry Collected With 4 Different Preservation Reagents

Geneve Awong, Deeqa Mahamed, Stephen Li, Vinicius Motta, Kevin Brown, Thiru Selvanantham

Analyzing stabilized whole blood samples using CyTOF® flow cytometry in combination with one of four commercially available preservation reagents can preserve major lineage staining patterns, fixation-sensitive markers and median signal intensity for **standardized sample collection and downstream processing of whole blood specimens**.

KEY TAKEAWAYS

- For assessment of surface and functional markers, PAXgene® and Cyto-Chex® tubes were able to reproduce population frequencies even after delayed processing. However, median marker intensities were reduced.
- Cytodelics Stabiliser preservation prior to staining affected fix-sensitive marker expression.
- PROT1 fixation after staining preserved cell frequencies and marker intensity.

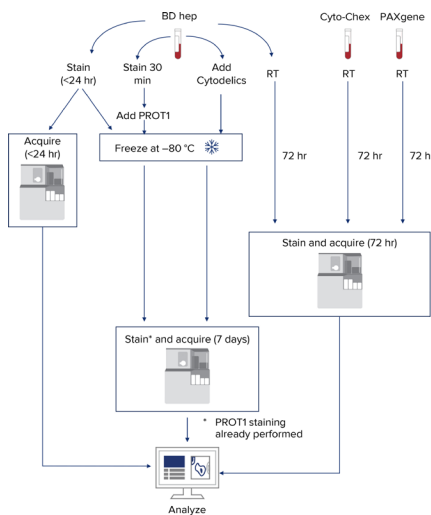
Background

Whole blood specimens are increasingly common due to ease of collection and availability, resulting in a need for standardized sample collection, shipping and downstream processing.

The goal of this study was to assess the effect of Cyto-Chex BCT (Streck), PAXgene Blood DNA Tube (BD Biosciences), Proteomic Stabilizer PROT1 (Smart Tube Inc.) and Cytodelics Stabiliser (Cytodelics) preservatives and their impact on data quality using a 37-marker CyTOF immune profiling antibody panel.

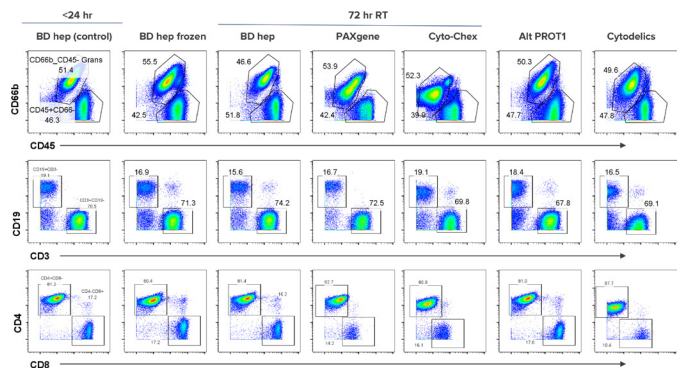
Study Design

Whole blood was drawn from six healthy donors into BD heparin (BD hep), Cyto-Chex and PAXgene blood collection tubes. Samples were shipped and centrally collected and processed <24 hours post-blood draw.



Results

- Major lineage staining patterns are preserved under each stabilization condition.
- The detection of CD4 and CD8 subsets remains intact for most preservation conditions.
- Chemokine receptor expression is maintained after collection in PAXgene or Cyto-Chex tubes.
- Reduction in median signal intensity is observed after 72 hours delayed sample processing.



Detection of major immune lineage surface markers by CyTOF technology

	CD45	CD3	CD4	CD8a	TCRβ	CD19	CD20	CD56	CD44	CD161	CD28	CD136	CD25_IL-2Rα	CD138A	CD45RO
BD hep 24 hr	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
BD hep frozen	0.8	0.9	0.9	0.9	0.9	1.0	0.7	0.8	0.9	0.9	0.8	0.9	1.0	0.9	0.9
BD hep 72 hr	0.9	1.1	1.0	0.9	1.0	0.8	1.1	0.6	0.7	0.9	1.1	1.1	0.8	0.7	0.8
PAXgene	0.8	0.9	0.8	0.1	0.7	1.2	0.9	0.6	0.6	1.0	1.0	0.2	0.8	0.6	0.6
Cyto-Chex	0.4	0.6	0.5	0.0	0.5	0.4	0.4	0.4	0.3	0.6	0.6	0.1	0.3	0.3	0.3
Alt PROT1	0.9	1.1	1.0	1.0	0.9	1.0	1.0	1.1	0.9	1.3	0.7	0.9	0.8	0.8	0.7
Cytodelics	0.5	0.4	0.3	0.1	0.4	0.5	0.3	0.9	2.8	0.5	0.4	0.3	0.6	1.6	0.6

Relative median signal intensity comparison of 15 immune profiling surface markers. Median intensity values from manual gating analysis (FlowJo™) were obtained and all values normalized to BD hep 24-hour condition. Red and blue values indicate an increase and decrease, respectively, in the relative intensity compared with control.

PROTOCOL

Whole Blood Profiling

Panel Information

Maxpar Direct Immune Profiling Assay						
30-marker single-tube backbone panel	CD45	CD8	CD161	CD183/CXCR3	TCR γ 6	CD20
	CD196/CCR6	CD11c	CD194/CCR4	CD185/CSCR5	CD294	CD66b
	CD123/IR-3R	CD16	CD25	CD28	CD197/CCR7	HLA-DR
	CD19	CD45RO	CD27	CD38	CD14	IgD
	CD4	CD45RA	CD57	CD56	CD3	CD127

T Cell Expansion Panel 3						
7-marker Expansion Panel	OX40	TIGIT	CD69	PD1	Tim-3	ICOS
	4-1BB					

Ordering Information | Standard BioTools™

Product Name	Product Number
Maxpar® Direct™ Immune Profiling Assay™	201325
Maxpar Direct T Cell Expansion Panel 3	201407
Maxpar Pathsetter™ v3.0	401019

Ordering Information | Other

Product Name	Company
Cyto-Chex BCT	Streck
PAXgene Blood DNA Tube	BD Biosciences
Proteomic Stabilizer PROT1	Smart Tube Inc.
Cytodelics Stabiliser	Cytodelics



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