

# Preserving Blood for Cytometry

When collecting clinical samples for cytometry, preservation method matters. This study compares how CytoChex, Transfix, and TokuKit affect immune cell frequencies and data quality.

**1** **CytoChex**

**2** **Transfix**

**3** **TokuKit**

# Key Findings

## B Cells

CytoChex preserved only **2-3% B cells**, representing a 2-5 fold loss compared to normal healthy donor range.

## T Cells

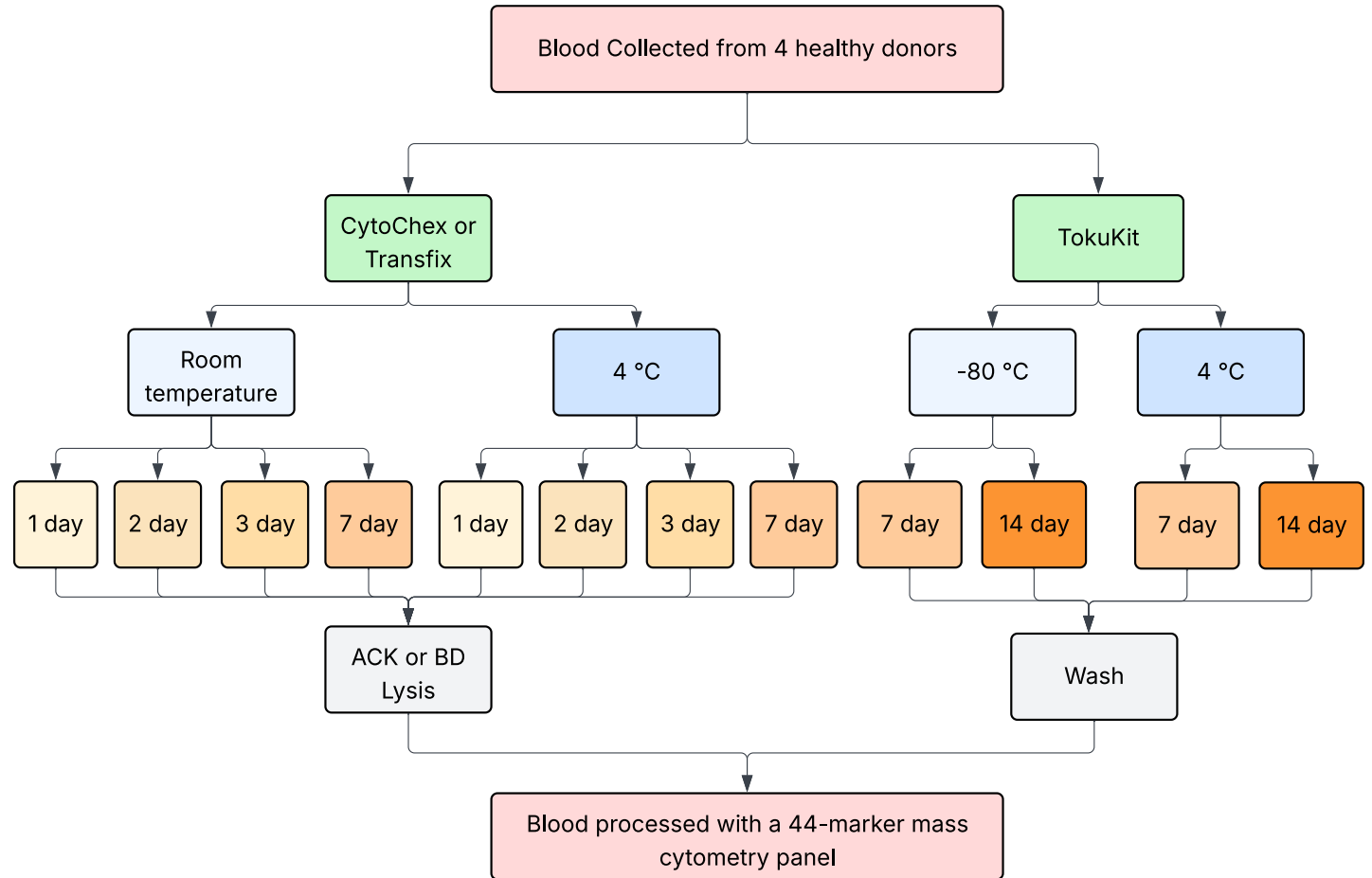
CytoChex showed **20% double-positive CD4<sup>+</sup>CD8<sup>+</sup>** T cells, a 2-4 fold increase over typical frequency.

## T-bet

Transfix failed to detect T-bet<sup>+</sup> cells, preserving **<1%** compared to expected ~30% frequency.

# Experimental Design

Head-to-head evaluation of common blood preservation methods.



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## Sample Collection

Whole blood from **four healthy donors** preserved with three methods: CytoChex, Transfix, and TokuKit.

- TokuKit: 4°C or -80°C storage
- CytoChex/Transfix: room temp or 4°C

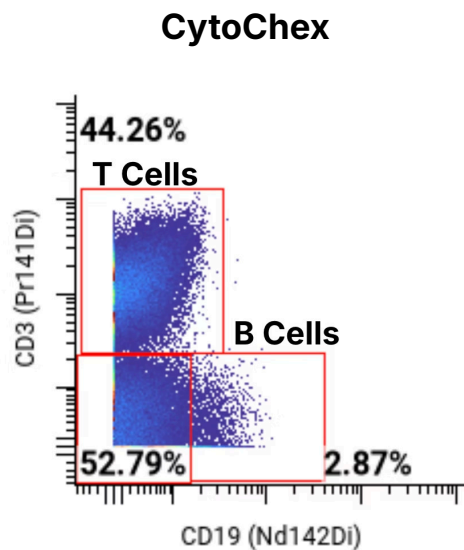
## Analysis Timeline

- CytoChex: 1, 2, 3, 7 days
- Transfix: 1, 2, 3, 7 days
- TokuKit: 7, 14 days

Samples were analyzed on a **44-marker mass cytometry panel** on CyTOF® Helios that analyzed T, B, NK, myeloid, and other immune populations.

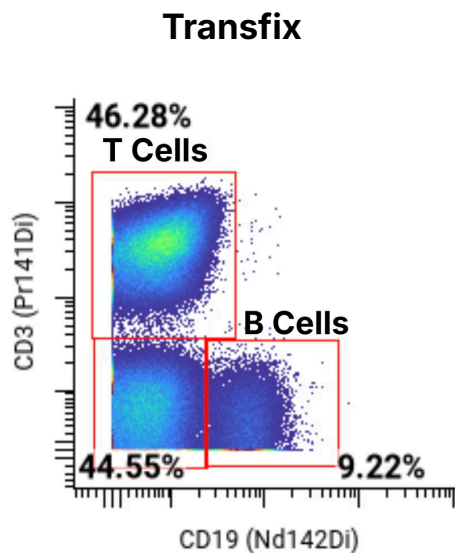
# CytoChex Decreased B Cell Frequencies

B cells normally account for **5-10% of non-granulocytes** in healthy donors. CytoChex resolved only 2-3% while Transfix and TokuKit preserved expected ranges.



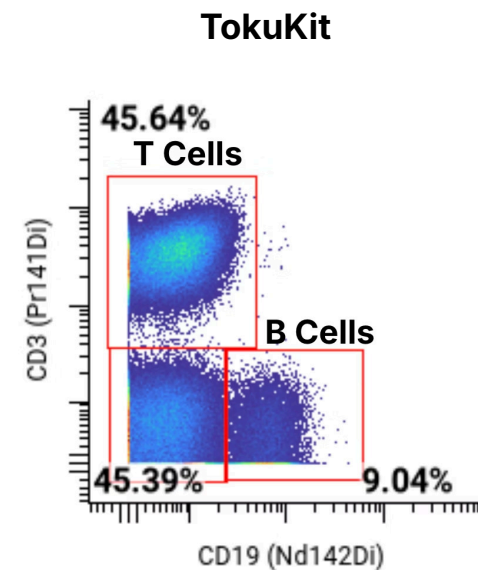
**2-3%**

Below normal range



**9-11%**

Within expected range

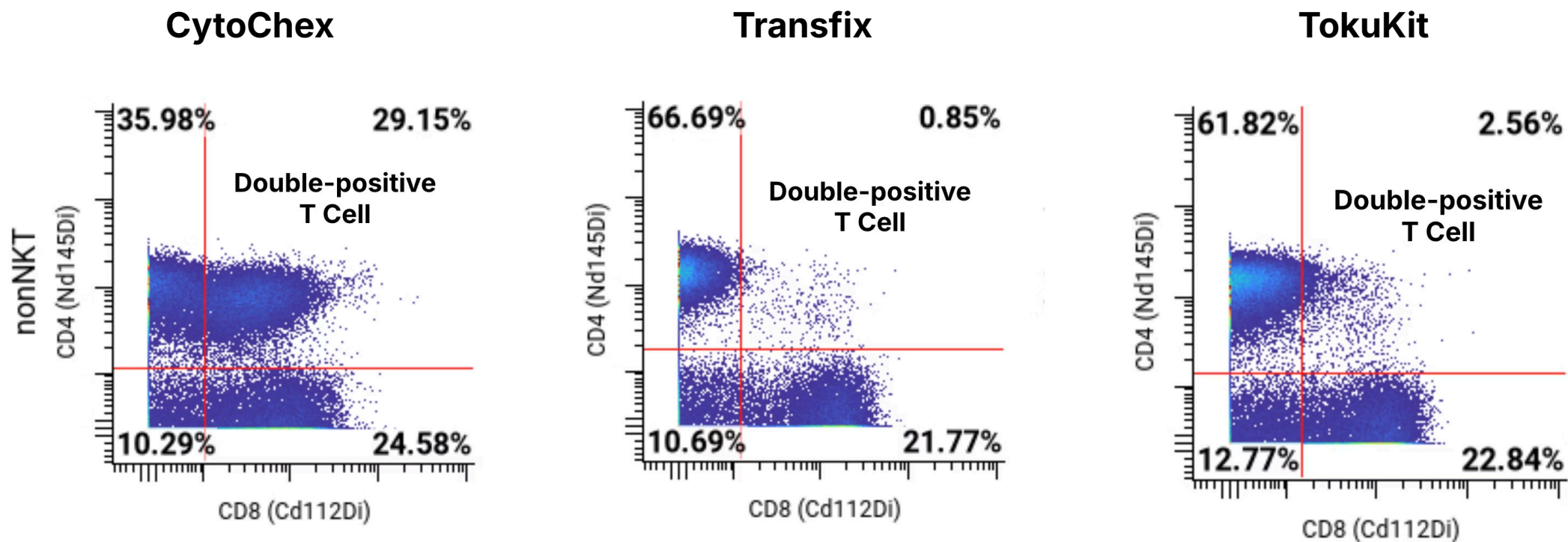


**7-9%**

Within expected range

# CytoChex Increased Double-Positive T Cells

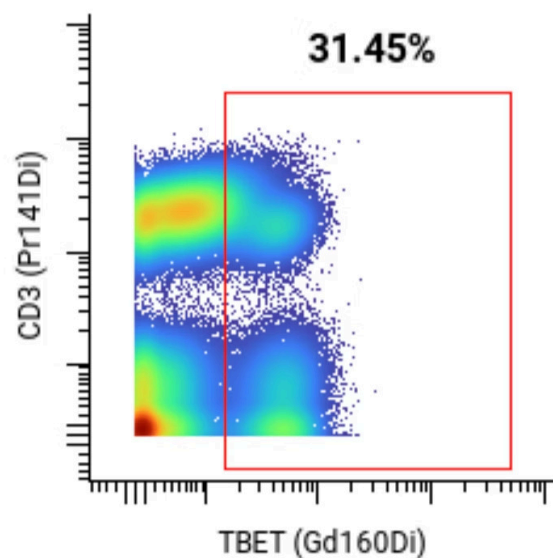
CD4<sup>+</sup>CD8<sup>+</sup> T cells normally represent **5-10% of total T cells**, but CytoChex samples reached **~30% after 7 days**, a 3-6 fold increase.



# Transfix Failed to Detect T-bet<sup>+</sup> Population

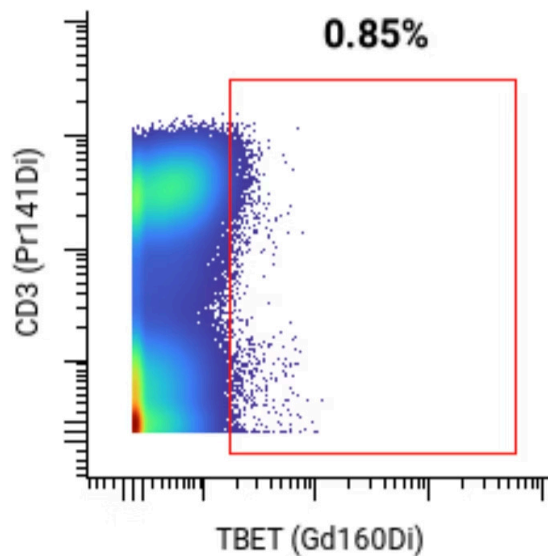
T-bet expression expected in NK cells,  $\gamma\delta$  T cells, and memory T cell subsets (~30%). Transfix preserved only ~1% T-bet<sup>+</sup> frequency while CytoChex and TokuKit maintained expected levels.

CytoChex



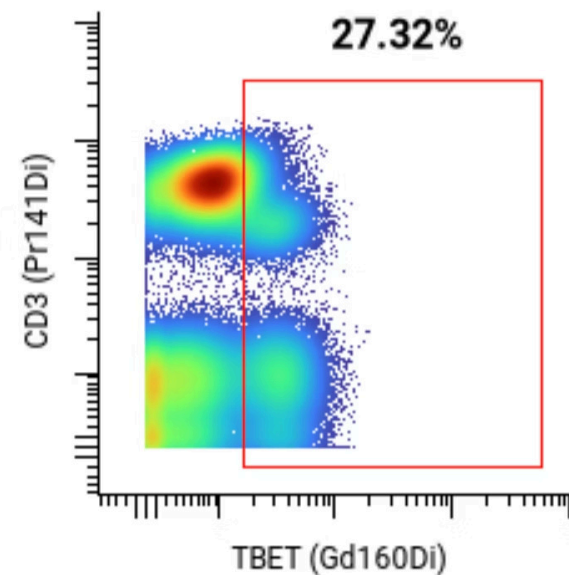
Clear T-bet<sup>+</sup> population

Transfix



No clear population

TokuKit



Clear T-bet<sup>+</sup> population

# Why Sample Preservation Matters



## Degradation Distorts Profiles

Preservation methods that degrade or introduce artifacts shift immune profiles, creating results that reflect instability rather than patient biology.



## Failed Samples Waste Resources

Degraded samples often fail QC, requiring costly redraws, repeat shipments, and delays in data delivery.



## Inconsistencies Undermine Insights

Processing time differences introduce noise, making it harder to detect real pharmacodynamic signals and biomarkers of response.



## Want to learn more?

Ask us about CytoChex, Transfix, and TokuKit comparison results—and upcoming TokuKit studies.





# References

1. Miltenyi Biotec. *MACS® handbook: Human cells and organs — Human cell sources: Blood (human)*. [Available online](#)
2. González-Mancera MS, Bolaños NI, Salamanca M, et al. Percentages of CD4<sup>+</sup>CD8<sup>+</sup> double-positive T lymphocytes in peripheral blood of adults from a blood bank in Bogotá, Colombia. *Turk J Haematol*. 2020;37(1):36-41.
3. Huang C, Bi J. Expression regulation and function of T-Bet in NK cells. *Front Immunol*. 2021;12:761920.