

ACOUSHASH

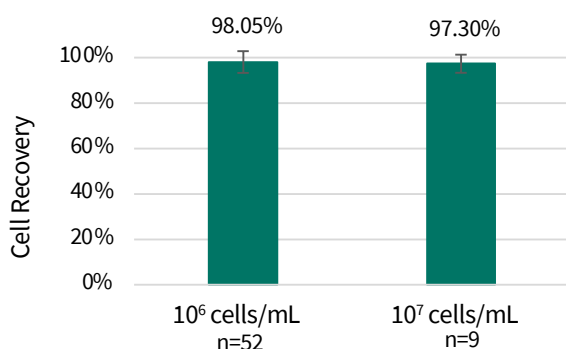
APPLICATION NOTE

CENTRIFUGE-FREE CELL WASHING

Traditional centrifugation-based washing methods often struggle with cell loss, low sample purity and operator-dependent results. AcouWash offers an automated and gentle method to wash cells, remove debris and unbound reagent with high efficiency, producing high-quality samples for downstream applications.

AcouWash cell washing specifications

- Sample volume 0.5-10 mL
- Up to 6 times cell enrichment
- Up to 450 $\mu\text{L}/\text{min}$ sample throughput
- **$\geq 97\%$ cell recovery**
- Maintained cell viability after processing
- Efficient buffer exchange
- Efficient **removal of contaminants**

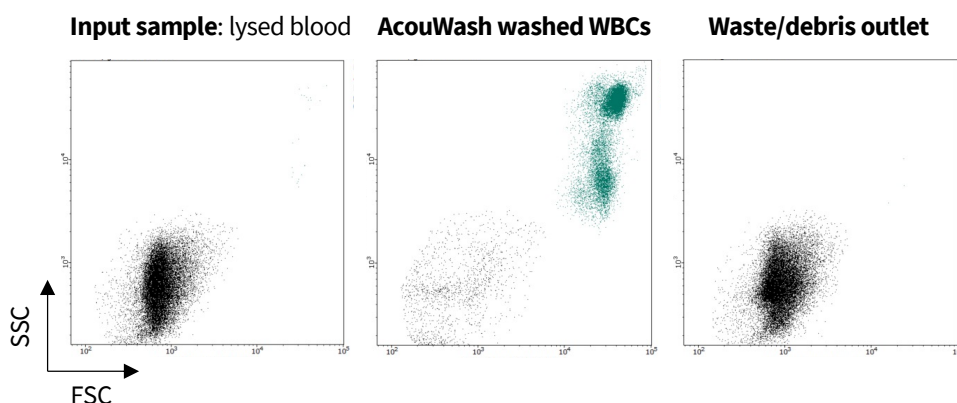


Jurkat cells of 10⁶ and 10⁷ cells/mL in RPMI medium were washed in AcouWash at 450 $\mu\text{L}/\text{min}$ throughput. The graph shows separation efficiency (number of cells in center outlet/number of cells in both outlets).

Sample	Contaminant	Contaminant removal (%)
Jurkat cells (10 ⁶ cells/mL)	1 μm particles	97.20 \pm 1.12 (n = 47)
Lysed whole blood	Debris and platelets	99.82 \pm 0.28 (n = 11)
Lysed whole blood	Protein	99.58 \pm 0.15 (n = 12)

Contaminant removal after AcouWash washing of various cell samples.

Application: WBC wash from lysed blood



Results

- WBC recovery 97.24%
- Debris removal 99.62%
- Protein removal 99.56%

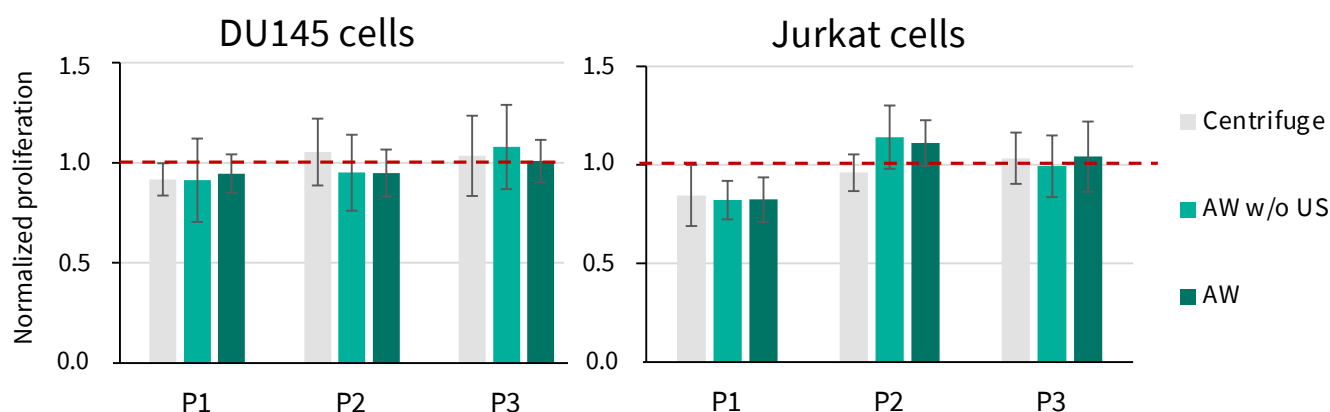
Conclusions

- Efficient washing minimizes problems with unspecific staining
- Ideal sample preparation for sensitive flow cytometry assays

Freshly drawn human blood (EDTA) was treated with BD Pharm Lyse. 2.2 ml sample was processed using AcouWash, washing the white blood cells into 400 μL of clean buffer (PBS with 10% Ficol-Paque). Input and output samples analyzed using flow cytometry (Guava easyCyte, Luminex). WBC recovery was calculated by comparing CD45+ events in the output sample and the waste. MicroBCA (Thermo Scientific) was used to measure the protein content in the input sample compared to the output sample. n=5.

ACOUWASH PROCESSING PRODUCES HEALTHY CELLS

- Proliferation studies performed on DU145 and Jurkat cells demonstrate that AcouWash processing does not impact cell proliferation
- The AcouWash offers a gentle and automated way of efficiently, accurately, and reproducibly wash cells



Jurkat cells and DU145 cells were cultured and aliquoted into four different samples to be handled in four ways; stored in fridge as bench control (dashed line); washed by centrifugation (125x g (900 RPM) for 5 min; grey); AcouWash processed without ultrasound (light green); washed in AcouWash with ultrasound (dark green). This was repeated for three passages (P1-P3) and the proliferation was normalized against the bench control. The results show that all processed samples have the same proliferation pattern after being processed, hence neither the AcouWash, the chip nor the ultrasound seem to have any adverse effect on the cell proliferation.

The AcouWash technology – Acoustic Separation

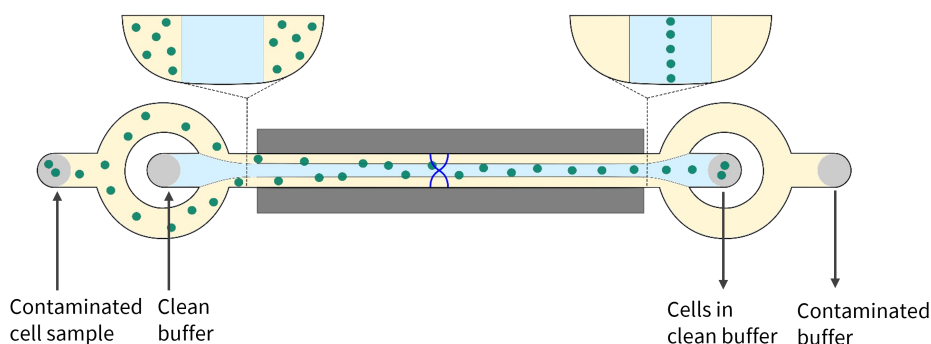


Illustration of the acoustic separation chip that sits inside the AcouWash. In the chip, a piezoelectric transducer generates an acoustic standing wave in the microfluidic channel. The acoustic field moves cells into the clean buffer in the center of the channel, while small particles or contaminants remain in the side fraction.