APPLICATION NOTE

AcouTrap

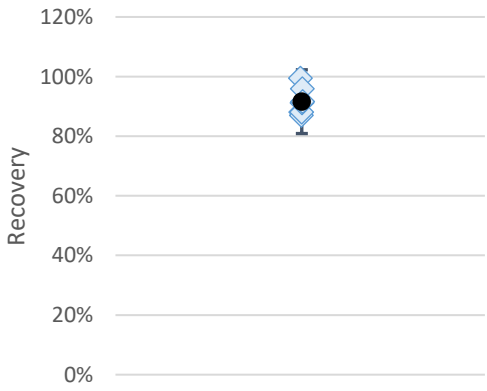
AUTOMATED CELL HANDLING

Rapid Staining and Washing of Precious Cells

Preparation of cell samples for flow cytometry typically involves staining with fluorescent antibodies. To improve specificity, a centrifugation-based wash is often performed, requiring several manual handling steps. This process can dramatically decrease the recovery and viability of the sample and is especially ill-suited for samples with low cell numbers. AcouTrap is an automated acoustofluidic platform for performing efficient staining and washing of cells with high recovery.

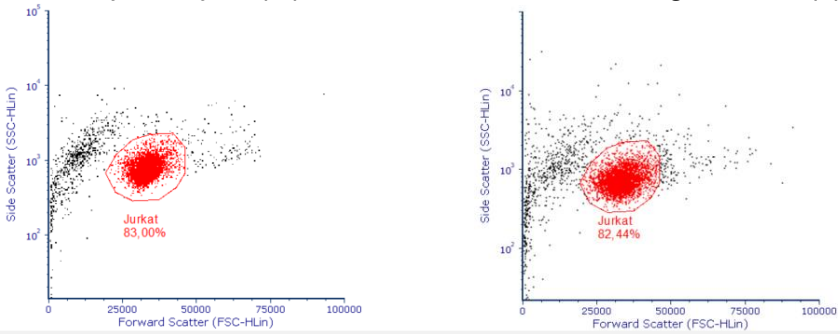
High recovery washing with maintained viability

- AcouTrap enables automated washing of low cell numbers with minimized cell loss
- Gentle wash of up to 50 000 cells per sample
- Maintained cell viability



Recovery of 50 000 cells with AcouTrap processing (n=9)

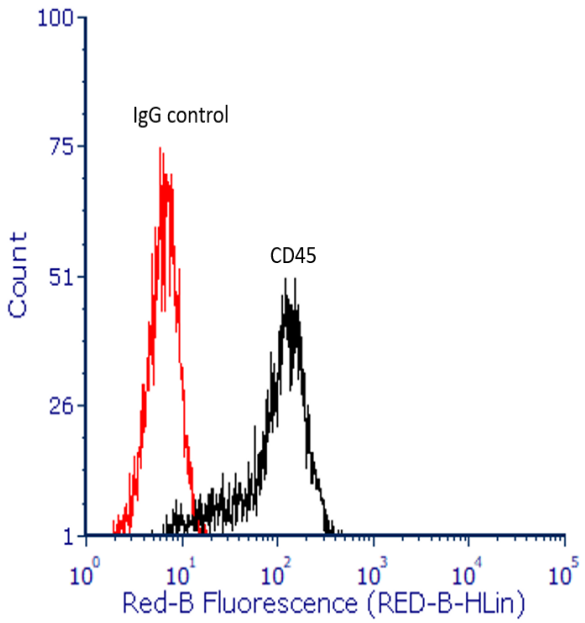
Comparison of flow cytometry cell populations before (left) and after (right) AcouTrap processing.



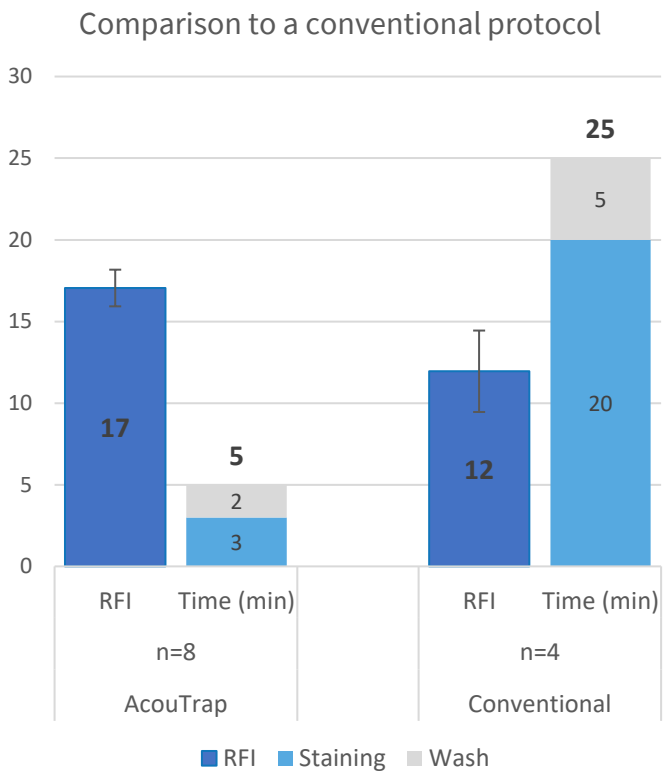
Cultured Jurkat cells were washed using AcouTrap. For recovery analysis, samples were measured directly using flow cytometry (Guava easyCyte, Luminex). For viability assessment, samples were stained using a live/dead kit (Guava ViaCount, Luminex) and analyzed using the ViaCount software. None of the samples showed a decrease in viable cells compared to the input sample (n=4).

AcouTrap provides improved performance of labeling assays

- Assay automation with minimized manual handling steps reduces variation
- Enhanced binding kinetics gives >90% staining efficiency already after 3 minutes of AcouTrap staining
- Efficient washing gives low level of background fluorescence meaning improved separation between populations
- AcouTrap staining and wash cycle produces higher relative fluorescence intensity (RFI) than conventional method including one centrifugation-based wash



Fluorescence intensity histogram of Jurkat cell samples stained and washed in AcouTrap using either CD45 or an isotype control.



Staining and washing of cultured Jurkat cells with 10 µl anti-CD45-PerCP or an isotype control was performed using either the AcouTrap method or a conventional method (20 minutes of incubation in the dark followed by a 1 ml wash at 200 rcf for 5 minutes). The samples were analyzed using a Guava easyCyte flow cytometer, counting 5000 events per sample. The RFI was calculated as the median fluorescence intensity of the CD45 signal over the median fluorescence intensity of the isotype control.