REMOVAL OF DMSO FROM CELL SAMPLES USING ACOUSTIC TRAPPING

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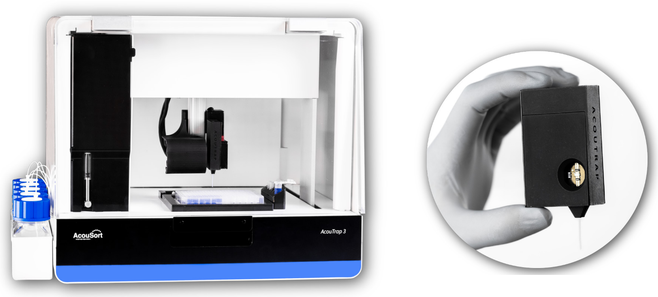
Introduction

Within personalized cell therapy, stem cells are typically kept frozen with 5 - 10% dimethyl sulfoxide (DMSO) added to maintain viability. The DMSO must be removed before cells are injected into a patient. There is currently a lack of a simple and automated method of removing DMSO from the small cell volumes used during e.g. stem cell treatments for cancer. Here, we demonstrate the use of acoustic trapping for automated washing of cells in DMSO with high recovery and viability, suitable for small cell samples.

Conclusions

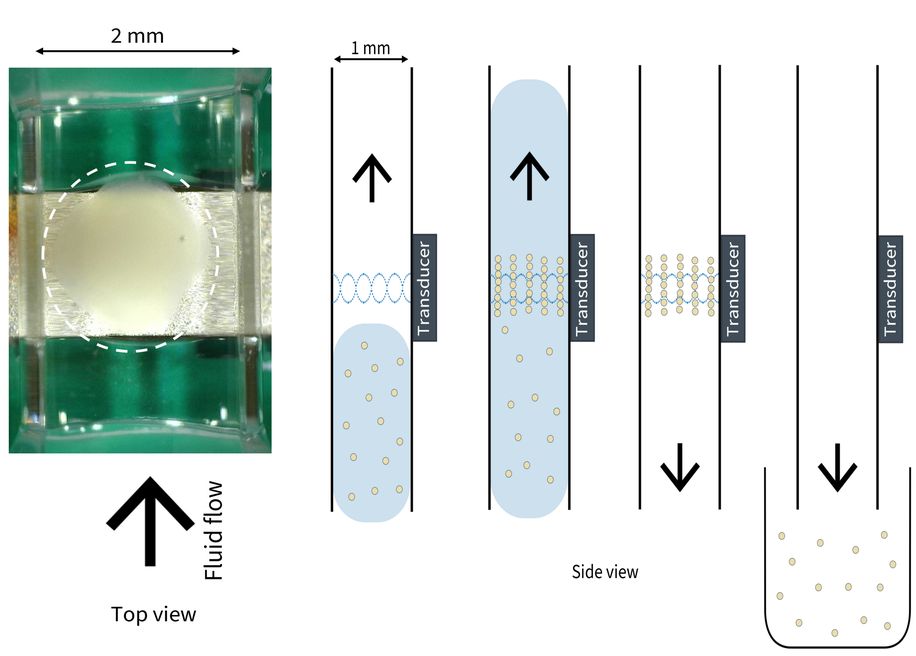
- The AcouTrap provides efficienct washing of small cell samples, removing DMSO or other contaminants
- Gentle processing with high recovery and maintained cell viability
- Acoustic trapping enables automated workflows compatible with OEM integration



Experimental and Results

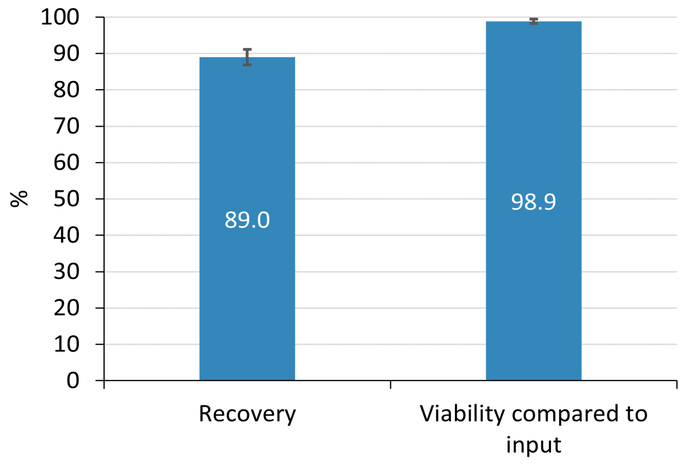
Acoustic trapping

The acoustic trapping unit consists of a glass flow cell attached to a 4 MHz piezoelectric element, creating 5 trapping zones where cells can be captured and levitated in the channel. Jurkat cells (400,000) in 5% DMSO buffer were aspirated through the trapping unit. The cells were trapped and washed with PBS + 0.4% BSA to remove the DMSO buffer.



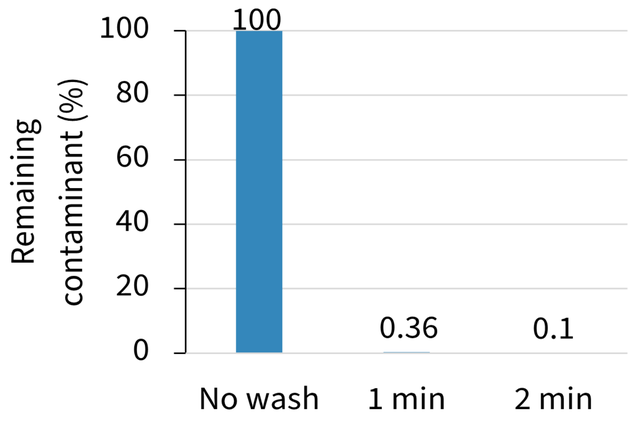
Recovery and viability

The eluted cell sample was analyzed for recovery and viability using flow cytometry (n=4).



Contaminant removal

To mimic DMSO washing efficiency measurements, Jurkat cells in PBS buffer were spiked with 1 µg/mL fluorescein and then washed for 1 or 2 minutes using the acoustic trapping method.



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