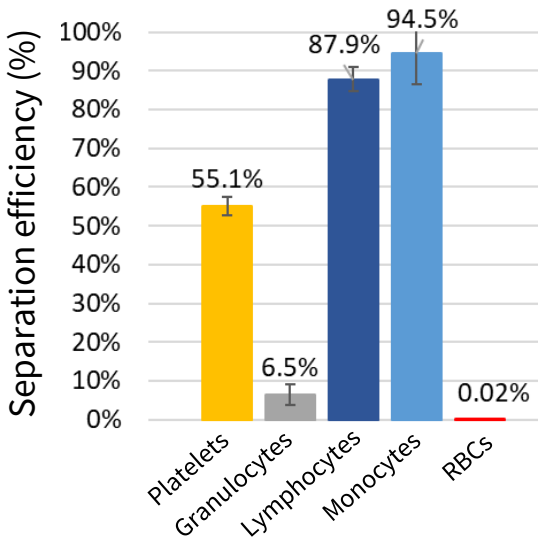
APPLICATION NOTE

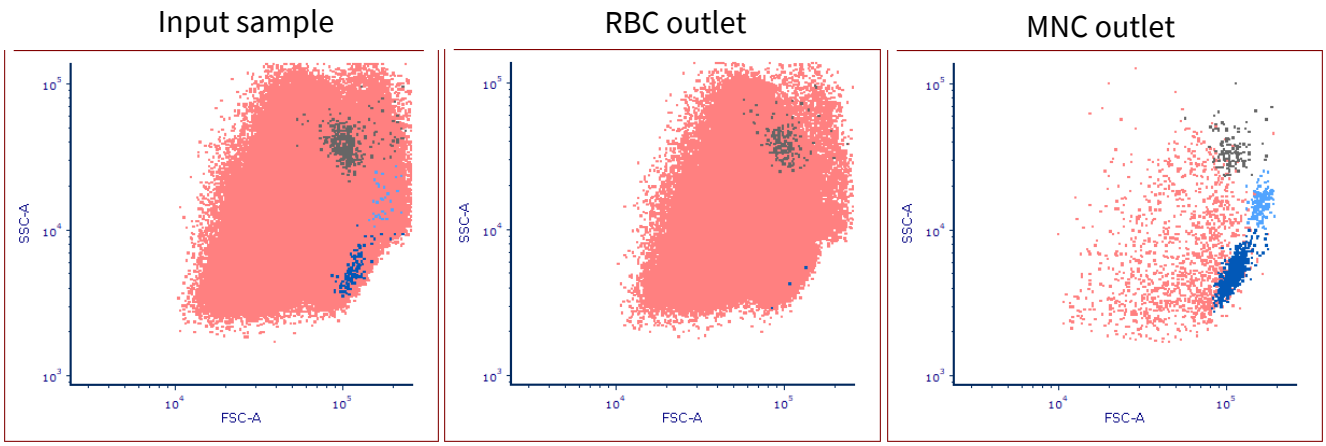
AcouWash

Mononuclear Cell Separation from Whole Blood

High Quality Label-free Acoustic Separation using Density Medium

- Automated high-quality separation of mononuclear cells (MNCs) in continuous flow acoustophoresis
- 89% separation efficiency of MNCs (lymphocytes + monocytes)
- 99.98% Red Blood Cell (RBC) depletion
- >90% viable cells
- 56% Purity
- 825x Relative enrichment





FACS plots showing the amounts of RBCs (light red), granulocytes (grey), monocytes (light blue) and lymphocytes (dark blue) in the input sample and the two output fractions.

Human whole blood was mixed with two parts of a 55% Optiprep solution in RPMI and processed in the AcouWash at 50 µl/min. Output samples were stained for CD45, CD61, CD235a and PI and analysed using BD FACS Canto II.

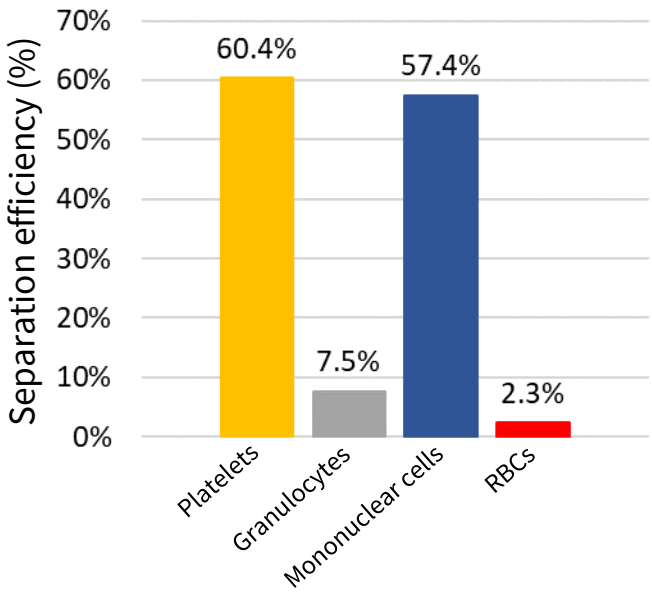
Comparison to Density Centrifugation

	AcouWash	Ficoll-Paque centrifugation*
Recovery	89% ± 4%	60% ± 20%
Purity	56% ± 12%	95% ± 5%
Cell viability	>90%	>80%
Remaining granulocytes	6%	5%
Automated	Yes	No
Process	1 pipetting step + load sample	3x centrifugation + several manual pipetting steps
Processing of small volumes (< 0.5 ml)	Yes	No

*Data taken from Ficoll-Paque product data sheet

Label-free separation without density medium

- Possible to separate mononuclear cells directly from whole blood without density gradient
- 57% separation efficiency of all MNCs
- 61% separation efficiency of lymphocytes and 48% of monocytes
- 97.7% RBC depletion
- 20x Relative enrichment



Undiluted human whole blood processed in the AcouWash at 50 µl/min. Output samples were stained for CD45, CD61, and CD235a and analysed using BD FACS Canto II.