Electronic Supplementary Material (ESI) for Lab on a Chip.

Extraction of small extracellular vesicles by label-free and biocompatible on-chip magnetic separation

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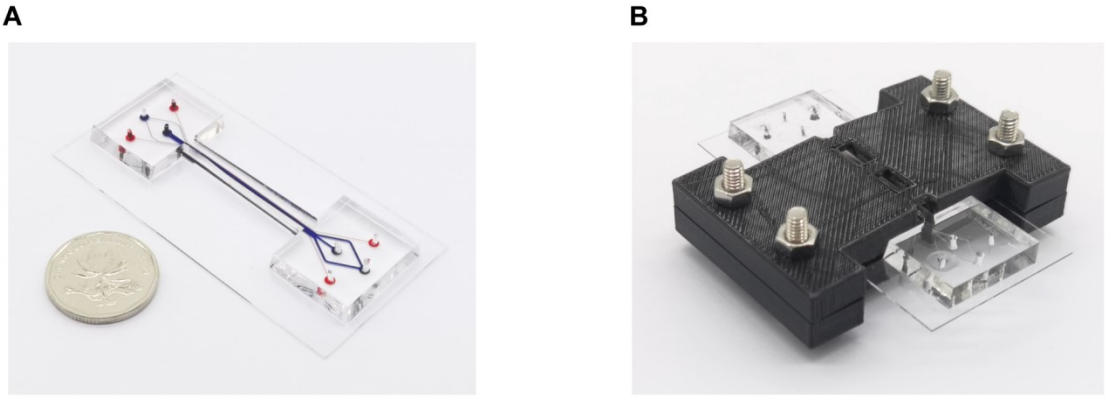

Fig. S1 The photography of the microfluidic chip and the separation system. **A** Photography of the microfluidic chip. **B** Photography of the separation system.

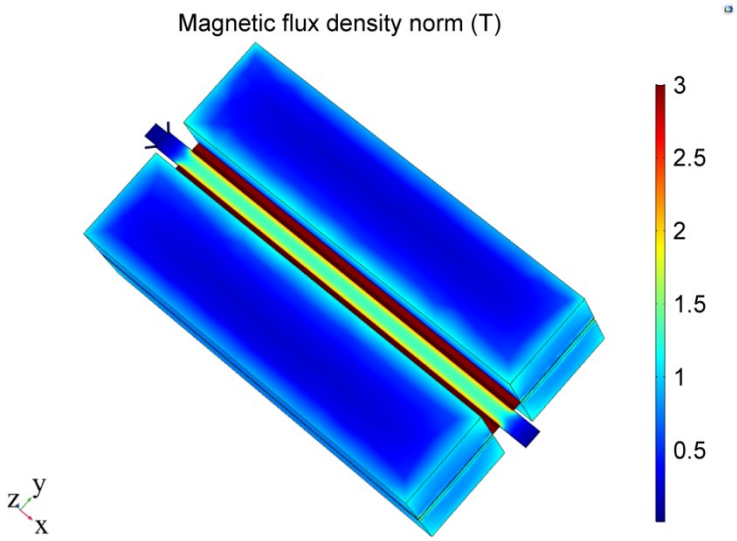

Fig. S2 The magnetic field distribution obtained from the 3D simulation model.

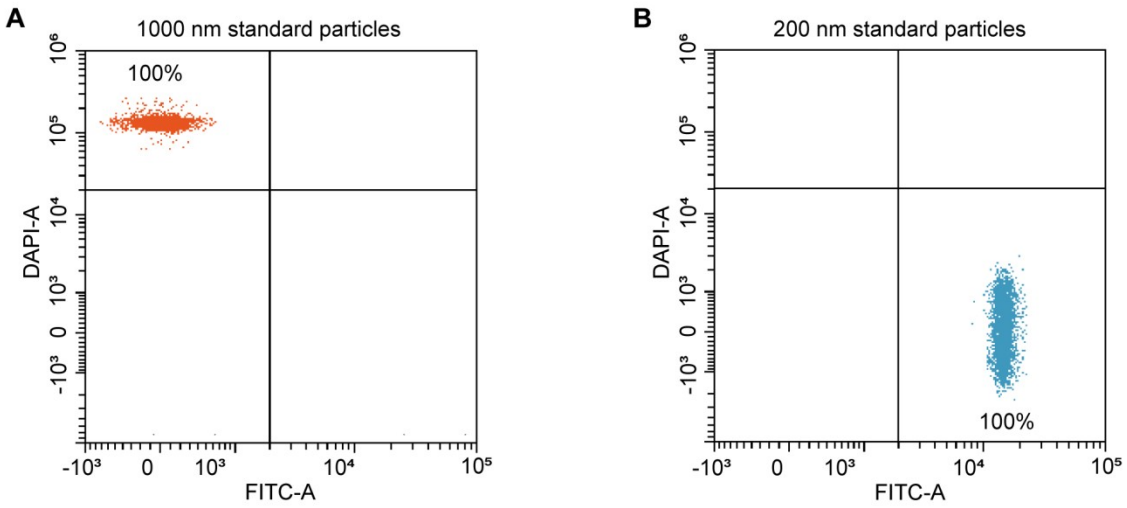

Fig. S3 Flow cytometry test results using size-calibrated fluorescent particles. **A** Test results of 1000 nm particles. **B** Test results of 200 nm particles.

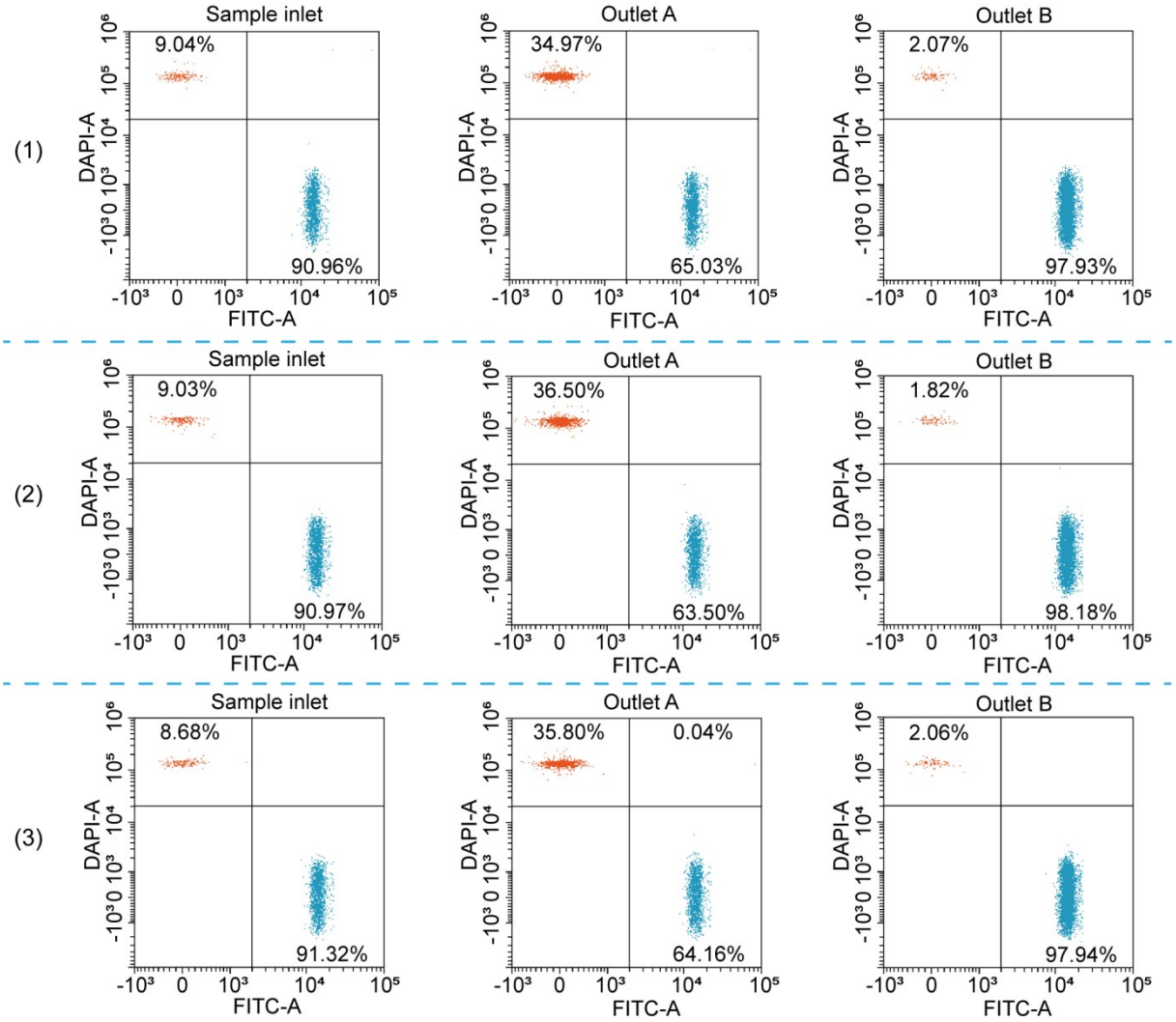

Fig. S4 The original detection results of the flow cytometer for particles separation.

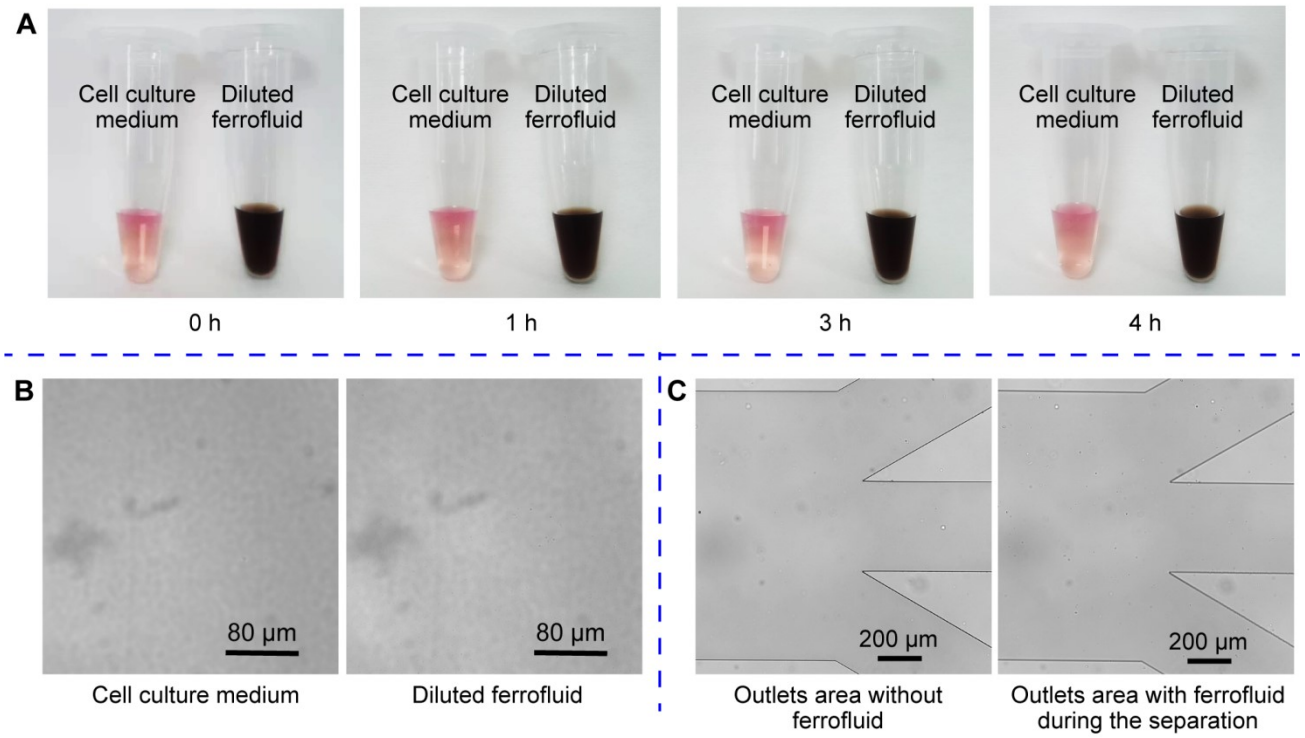

Fig. S5 A The comparison of the cell culture medium and the ferrofluids diluted with cell culture mudium (0.003×). **B** The microscope images of the cell culture medium and the ferrofluids diluted with cell culture medium (0.003×) after 4 h. C Bright field images of the outlets area without ferrofluid and that with ferrofluid (0.003×) during the sEVs separation.

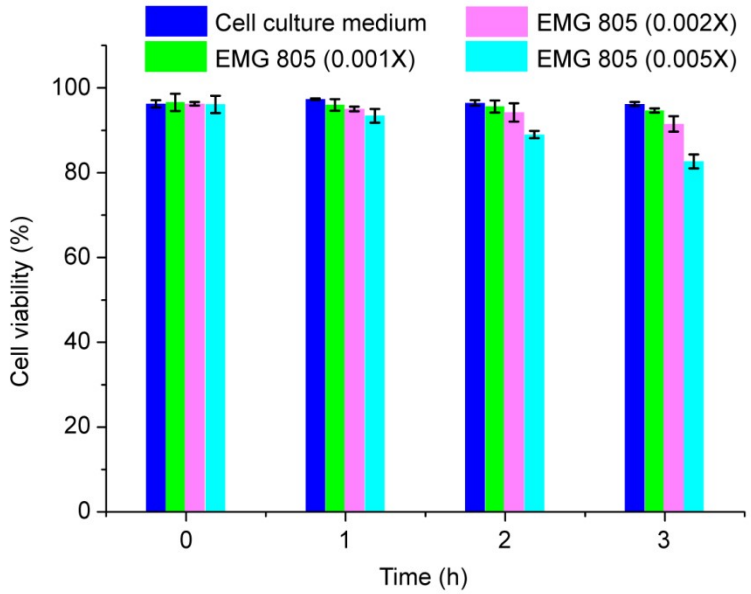

Fig. S6 The viability of BMSCs in the cell culture medium and the ferrofluid of different concentrations.

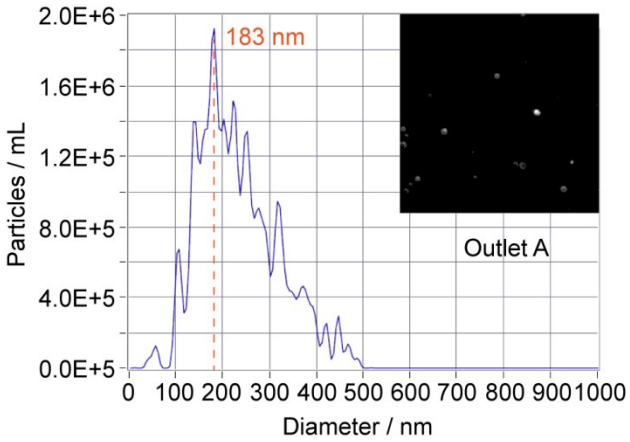

Fig. S7 The NTA measurement results of the EVs sample collected from outlet A.

Tab. S1 The parameters used in the numerical simulations

Parameters	Value
Remanent flus density of the magnets	1.48 T
Relative permeability of ferrofluid after dilution	1.00069
Relative permeability of Fe_3O_4 powder[1]	4
Relative permeability of permalloy	80000
Dynamic viscosity of the ferrofluid after dilution	0.001 Pa · s

REFERENCES

1. M. Hotta, M. Hayashi and K. Nagata. *ISIJ Int.*, 2011, **51**, 491-497.