Electronic Supplementary Material (ESI) for RSC Advances.


# Facile, rapid and efficient isolation of circulating tumor cells using aptamer-targeted magnetic nanoparticles integrated with a microfluidic device

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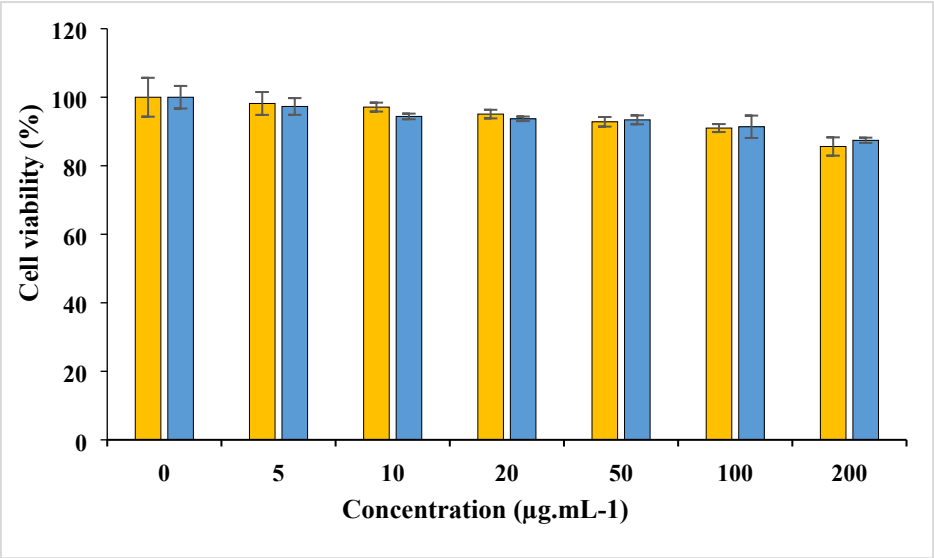


**Fig. S1.** The viability of HUVEC (yellow) and MCF-7 (blue) cells after exposure with different concentrations of MNPs.

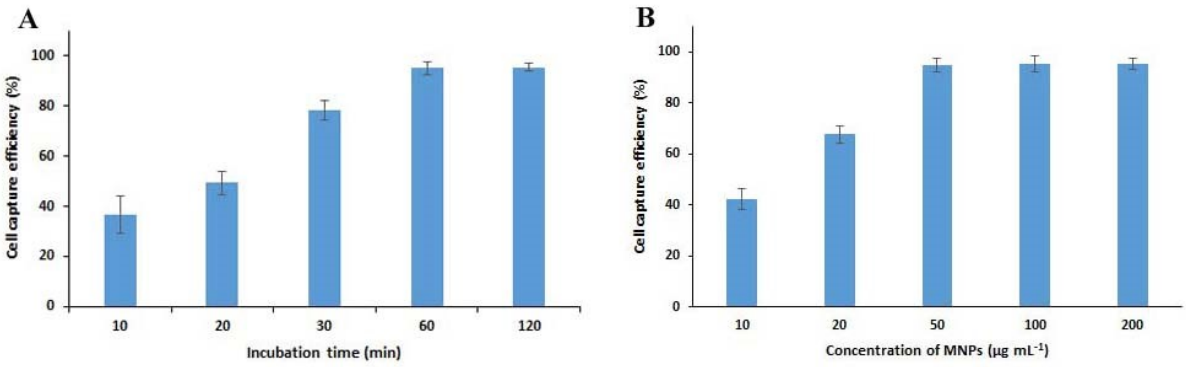


**Fig. S2.** Effect of the incubation time (A) and MNPs concentration (B) on the capture efficiency of MCF-7 cells by using APT-MNPs.

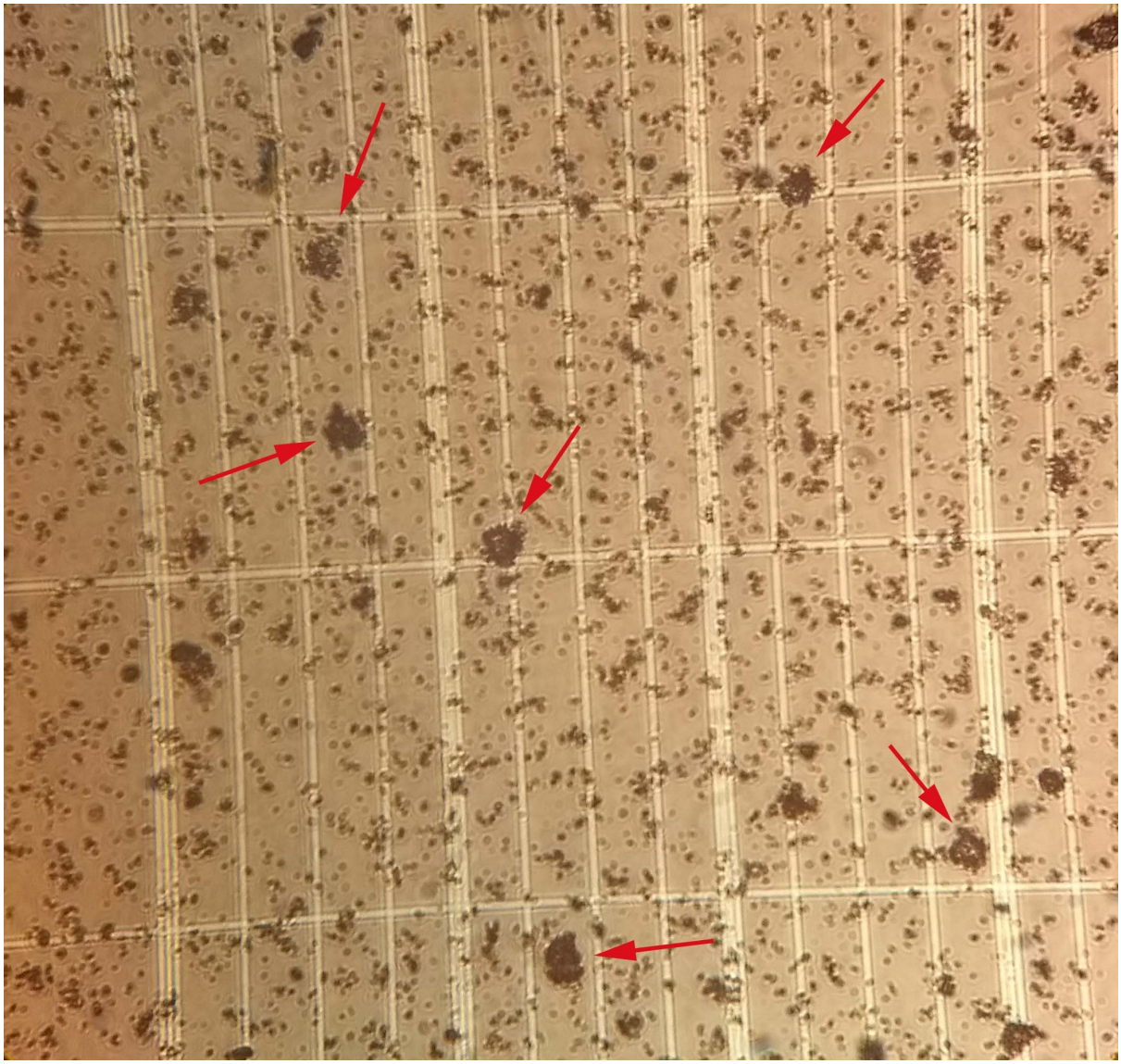

**Fig. S3.** The optical microscope image of captured MCF-7 cancer cells by Apt-MNPs.

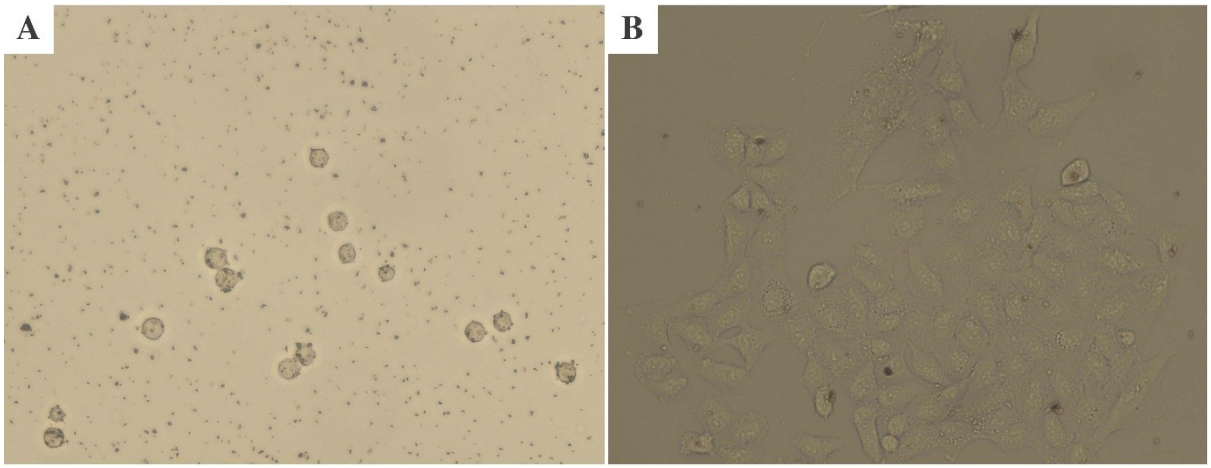


**Fig. S4.** The viability and proliferation of magnetically captured MCF-7 cancer cells. (A) Immediately after capturing and (B) 2 weeks after *in vitro* culture.

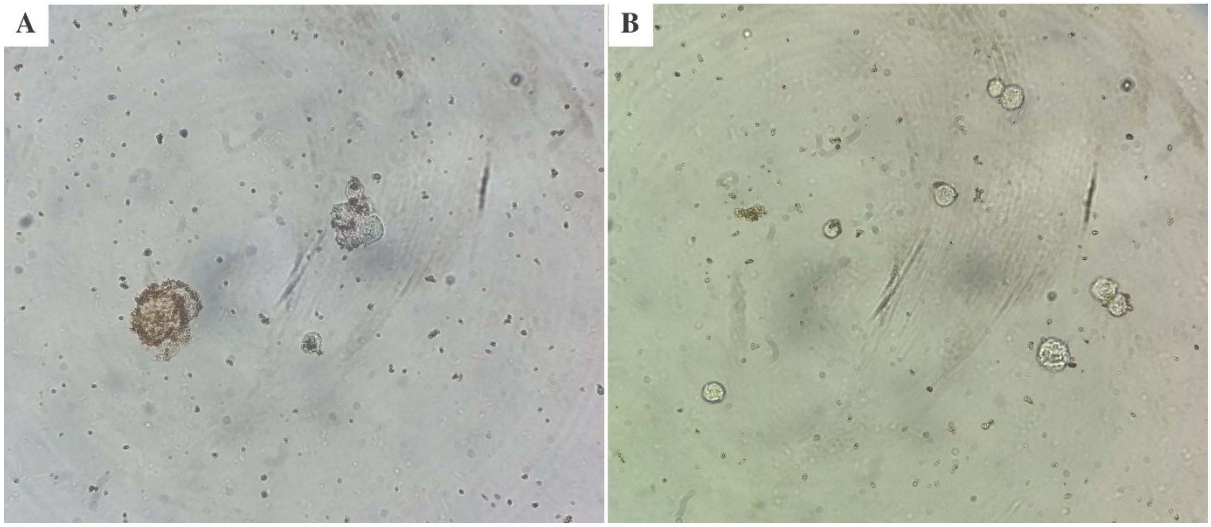


**Fig. S5.** The optical microscope images of magnetically captured cells from the blood samples of breast cancer patient (A) and healthy donor (B).

**Table S1.** The number of isolated CTCs from the peripheral blood samples of breast cancer patients using the APT-MNPs and EasySep™ Kit.

| samples | APT-MNPs | EasySep™ Kit | Stage |
|---|---|---|---|
| 1 | 2 | 2 | 4 |
| 2 | 2 | 1 | 4 |
| 3 | 2 | 1 | 4 |
| 4 | 1 | 0 | 4 |
| 5 | 2 | 0 | 4 |