Supporting Information for

Isolation of DNA Aptamer targeting N-cadherin and High-E□ciency Capture of Circulating Tumor Cells by using Dual Aptamers

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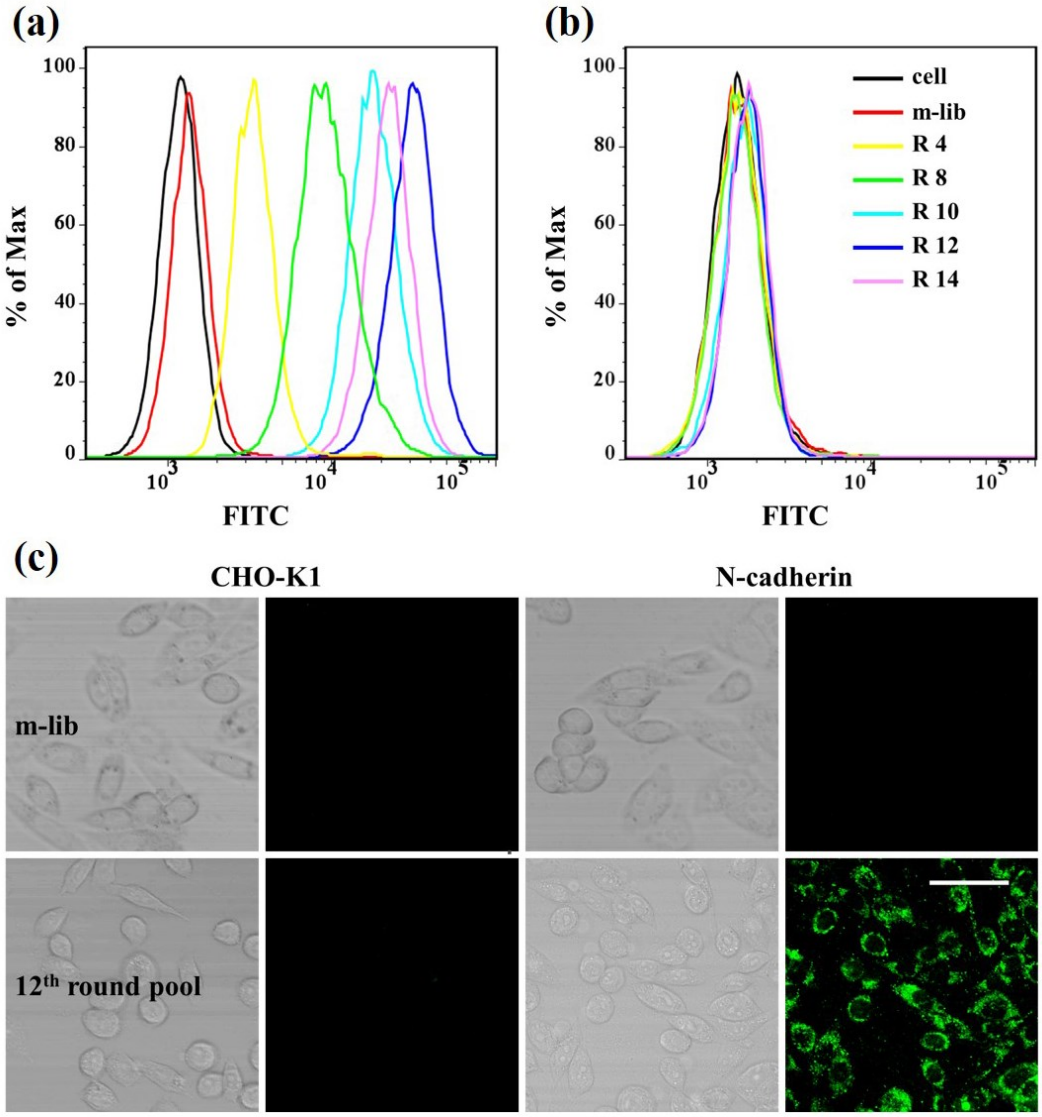

Figure S1. Binding assay of selected pool with N-cadherin and CHO-K1 cells. Flow cytometry assay to monitor the binding of selected pool (4 th, 8 th, 10 th, 12 th and 14 th round) with N-cadherin cells (target cells) (a) and CHO-K1 cells (control cells) (b). Confocal imaging of cells stained by the m-lib or the 12th round selected pool labeled with FAM (c). Upper left: images of CHO-K1 cells after incubation with m-lib. Lower left: images of CHO-K1 cells after incubation with 12th round selected pool. Top right: images of N-cadherin cells after incubation with m-lib. Lower right: images of N-cadherin cells after incubation with 12th round selected pool. In each picture, left is the optical image and light is the fluorescence image. The final concentration of FAM-labeled sequences is 250 nM. The scale bar in the images is 50 μm.

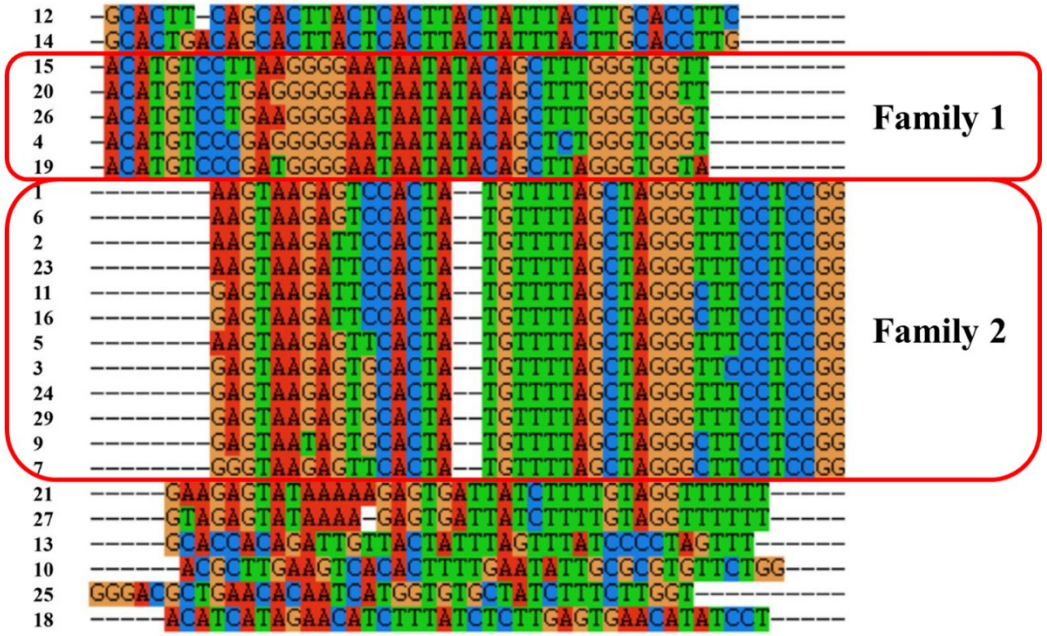

Figure S2. Sequences alignment analysis result by Clustalx 1.8.3.

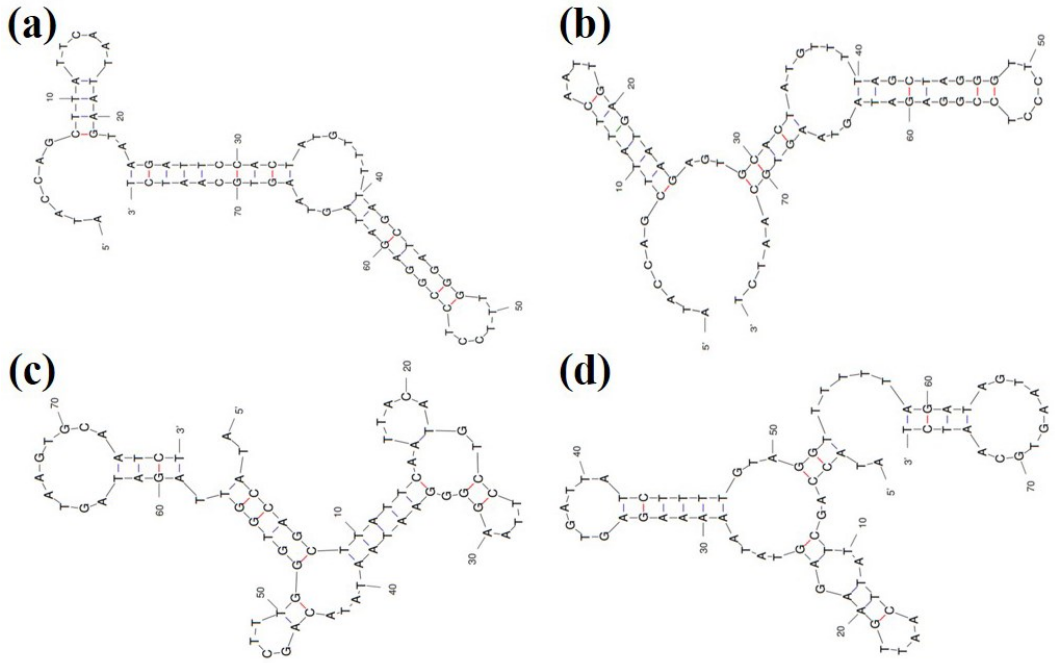

Figure S3. The predicted secondary structures and binding affinity of aptamer candidates. The predicted secondary structures of NC-2, NC-3 (b), NC-15 (c) and NC-21 (D) by M-fold (http://mfold.rna.albany.edu/) under 4 ^{o}C, where the concentrations of sodium and magnesium were 140 mM and 5 mM, respectively.

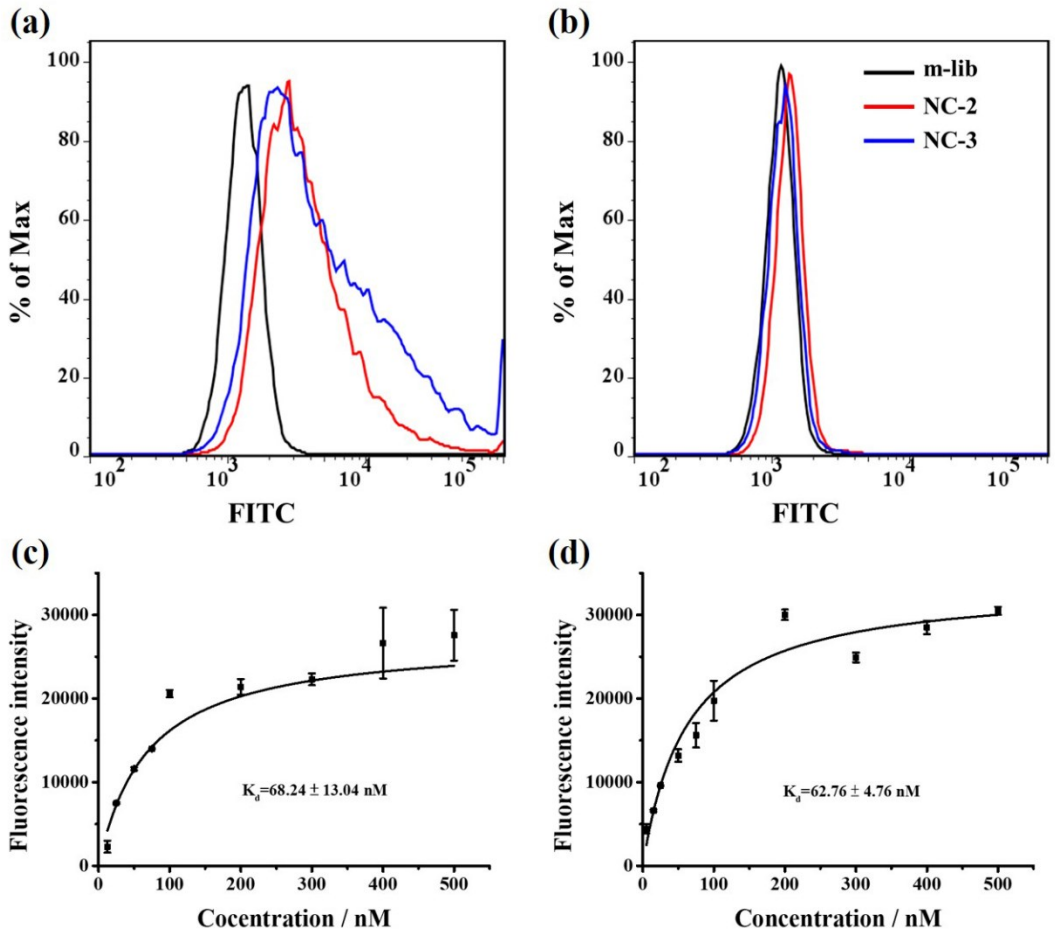

Figure S4. Binding assay of selected aptamer NC-2 and NC-3 with N-cadherin and CHO-K1 cells. Flow cytometry assay for the binding of aptamer candidates with N-cadherin (a) and CHO-K1 cells (b). Dissociation constant (K_d) curve of NC-2 (c) and NC-3 (d) for N-cadherin cells. The standard deviation was obtained from 2-4 separate trials.

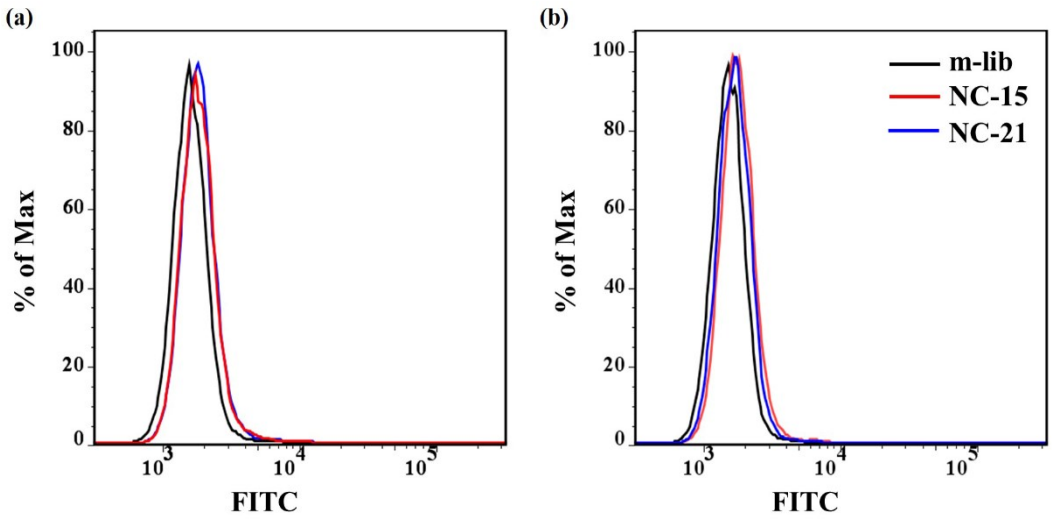

Figure S5. Binding assay of selected aptamer NC-15 and NC-21 with N-cadherin and CHO-K1 cells. Flow cytometry assay for the binding of aptamer candidates with N-cadherin (a) and CHO-K1 cells (b).

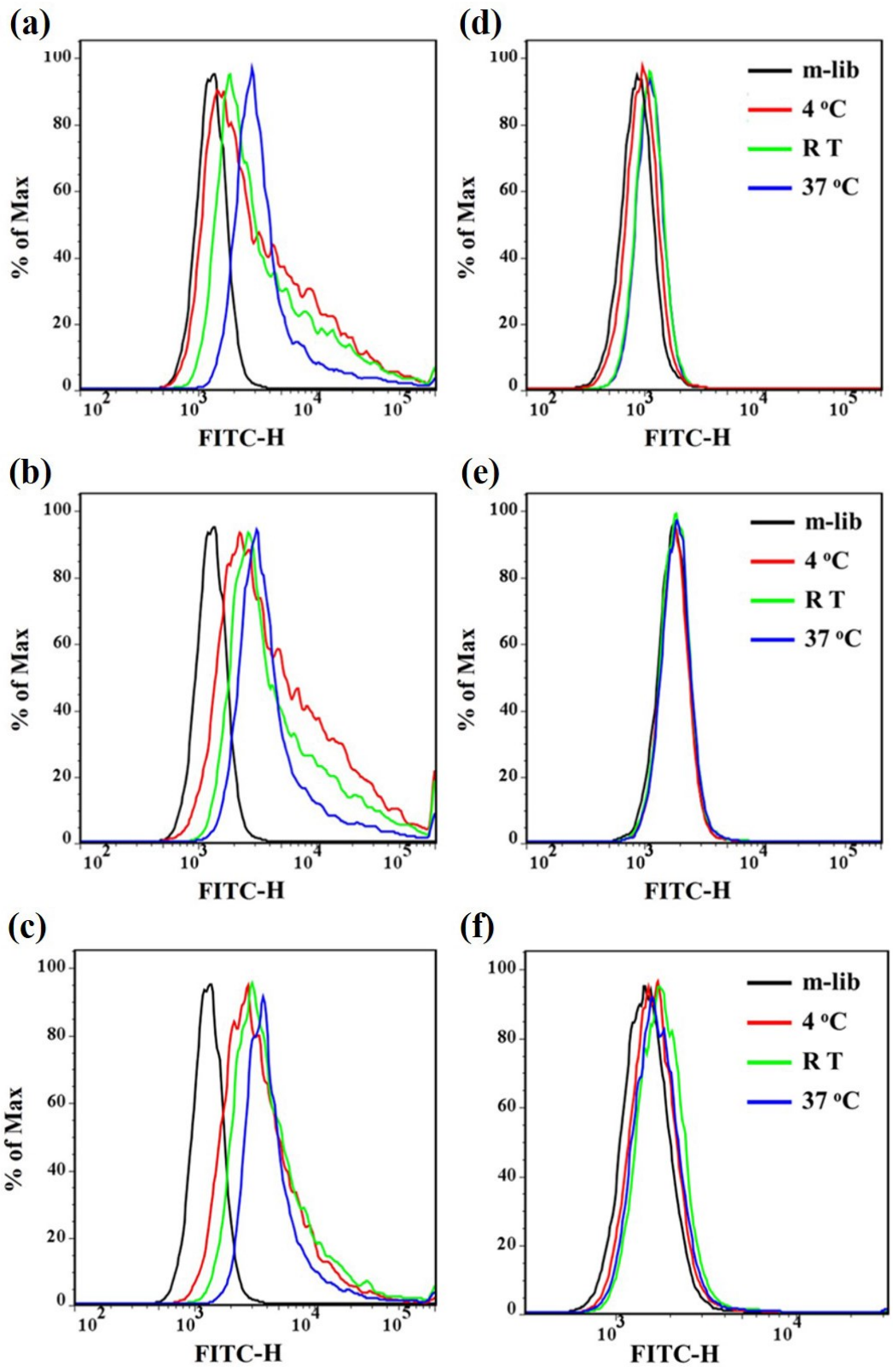

Figure S6. Flow cytometry assay for the binding capacity of aptamer candidates at various incubation temperatures (4 °C, RT and 37 °C). Flow cytometry assay for the binding capacity of aptamer candidate NC-2 (a), NC-3 (b) and NC3S (c) to N-cadherin, and that of NC-2 (d), NC-3 (e) and NC3S (f) to CHO-K1 cells. The final concentration of FAM-labeled sequence is 250 nM.

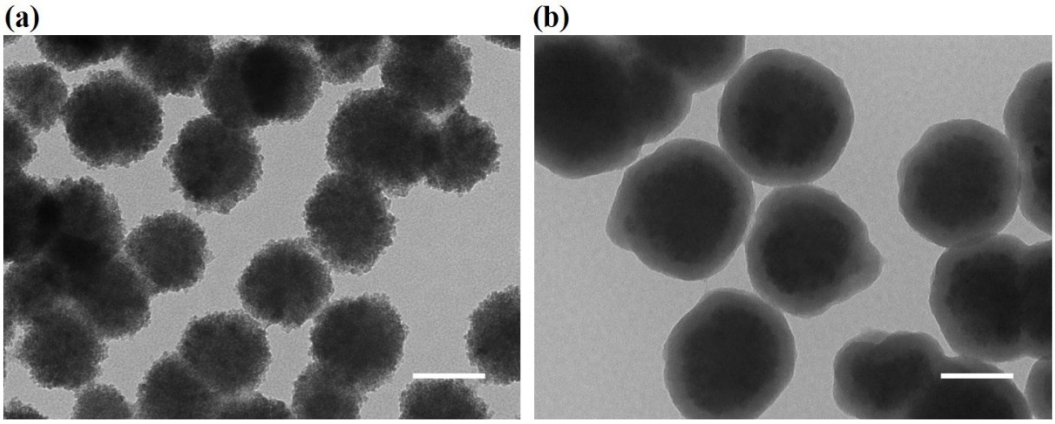

Figure S7. TEM images of (a) MNPs and (b) MNPs@SiO_2. The scale bar in the images is 100 nm.

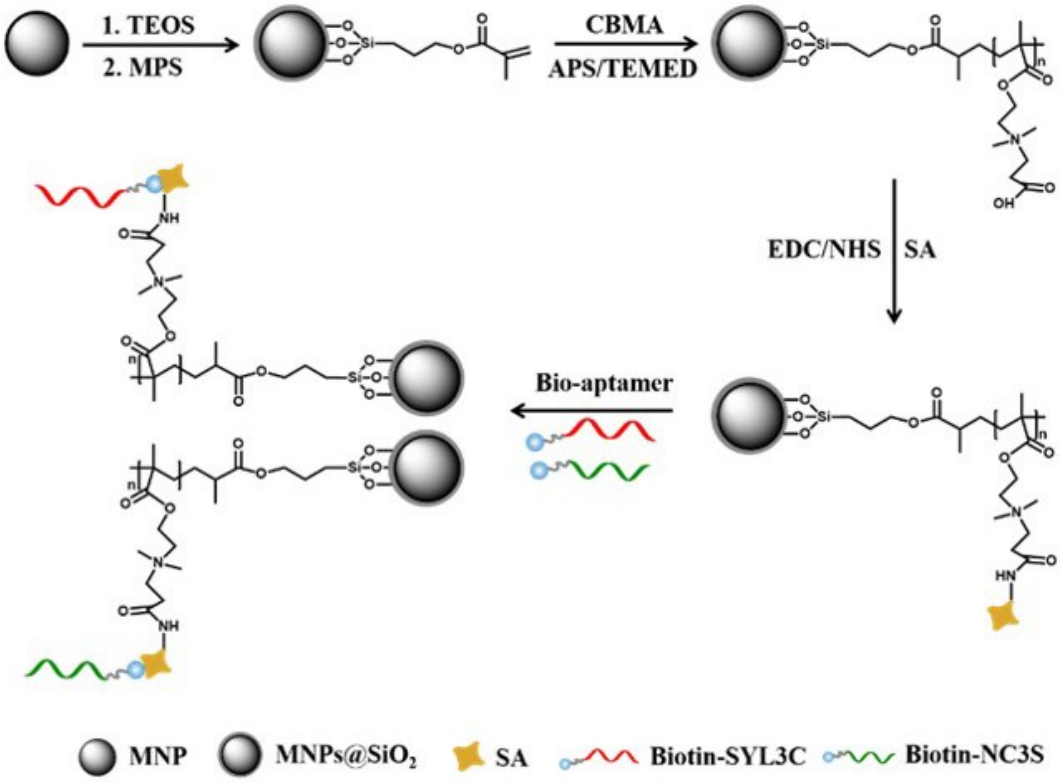

Figure S8. The interfacial modification to prepare aptamer-grafted MNPs for CTC isolation from blood samples of patients.

Table S1. Clinical Characteristics of Breast Cancer Patients (BrC), Rectal Cancer Patients (ReC), Colon Cancer Patients (CoC), Ovarian Cancer Patients (OvC), and Healthy Donors (HD) Enrolled in Our Study.

Sample ID	Gender	Age	Surgery	Chemotherapy	Clinical stage	Diagnosis	CTC count/mL
BrC1	Female	51	Yes	Yes	IV	Breast Cancer	6
BrC2	Female	48	Yes	Yes	IV	Breast Cancer	1
BrC3	Female	41	Yes	Yes	IV	Breast Cancer	4
BrC4	Female	32	Yes	Yes	IV	Breast Cancer	1
BrC5	Female	40	Yes	Yes	IV	Breast Cancer	7
BrC6	Female	41	No	No	II	Breast Cancer	0
BrC7	Female	62	Yes	No	I	Breast Cancer	1
BrC8	Female	38	Yes	Yes	II	Breast Cancer	2
BrC9	Female	42	Yes	Yes	I	Breast Cancer	2
BrC10	Female	42	Yes	Yes	II	Breast Cancer	3
BrC11	Female	68	Yes	No	II	Breast Cancer	4
ReC1	Male	66	Yes	Yes	IV	Rectal Cancer	3
CoC1	Male	78	Yes	Yes	IV	Colon Cancer	6
CoC2	Female	78	Yes	Yes	IV	Colon Cancer	7
OvC1	Female	68	Yes	Yes	III	Ovarian Cancer	12
OvC2	Female	64	Yes	Yes	IV	Ovarian Cancer	0
HD1	Male	35	N/A	N/A	N/A	Healthy Donor	0
HD2	Female	25	N/A	N/A	N/A	Healthy Donor	0
HD3	Male	40	N/A	N/A	N/A	Healthy	0

HD4	Female	23	N/A	N/A	N/A	Donor Healthy Donor	0
HD5	Female	27	N/A	N/A	N/A	Healthy Donor	0
HD6	Male	32	N/A	N/A	N/A	Healthy Donor	0