Electronic Supplementary Information (ESI) for Nanoscale

Size-matching hierarchical micropillar arrays for detecting circulating tumor cells in breast cancer patients' whole blood

Zhongshun Wang,[a] Daren Xu,[a] Xuekui Wang,[b] Yue Jin,[c] Bo Huo,[c] Yalei Wang,[a] Chengyan He,[b] Xueqi Fu[c] and Nan Lu*[a]*

[a]State Key Laboratory of Supramolecular Structure and Materials, College of Chemistry, Jilin University, Changchun, 130012, P. R. China. Email: luenan@jlu.edu.cn; Fax: +86 0431-85168477

[b]Department of Breast Surgery, China-Japan Union Hospital of Jilin University, Changchun, 130033, P. R. China

[c]College of Life Sciences, Jilin University, Changchun, 130012, P. R. China. Email: fxq@jlu.edu.cn

Table of content

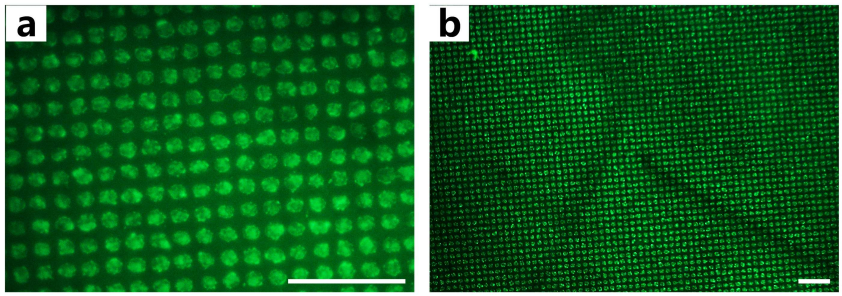

Fig. S1 Fluorescence micrographs of anti-EpCAM/PDMS-1 after the incubation with FITC-labeled goat antimouse secondary antibody. The scale bars are 100 μm.

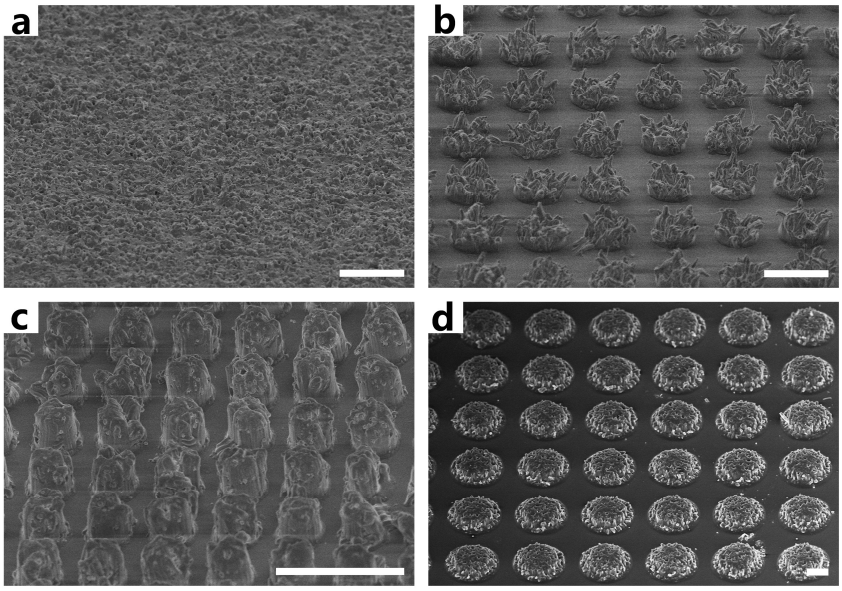

Fig. S2 SEM images of (a) RPDMS, (b) PDMS-1, (c) PDMS-2, and (d) PDMS-3 at 45° stage tilt angles. The scale bars are 20 μm.

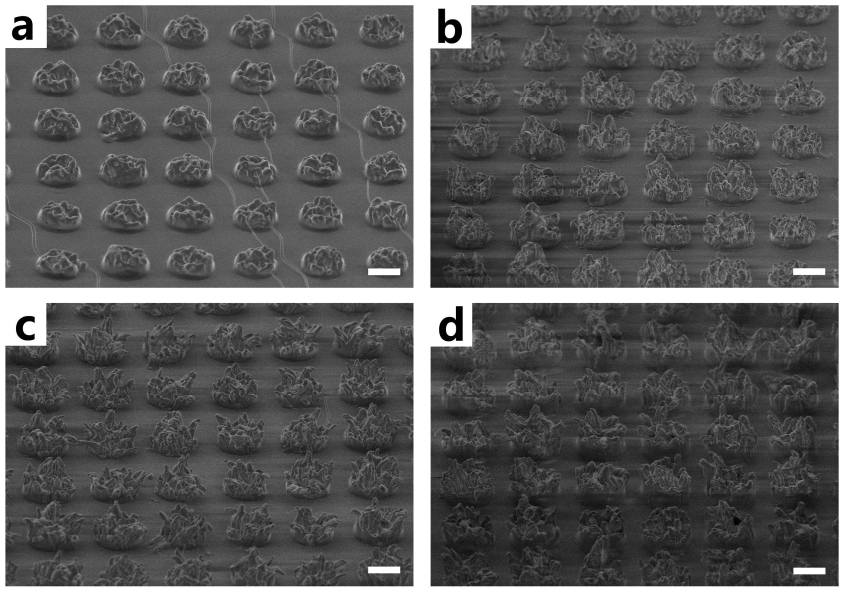

Fig. S3 SEM images of PDMS-1 of different heights at 45° stage tilt angles. The height of PDMS-1 is 6, 8, 10, 12 μm, in sequence. The scale bars are 10 μm.

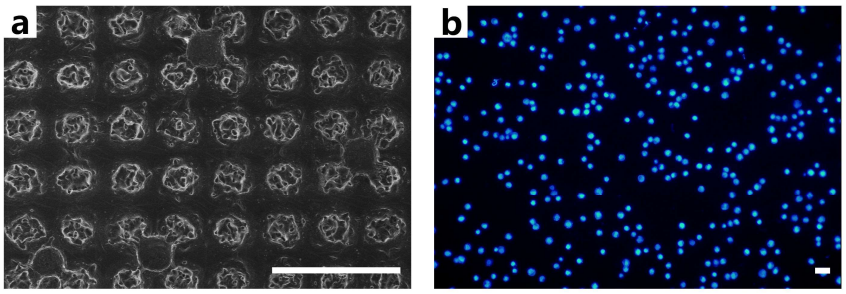

Fig. S4 (a) SEM image and (b) Fluorescence micrograph of MCF-7 cells captured on anti-EpCAM/PDMS-1. The scale bars are 50 μm.

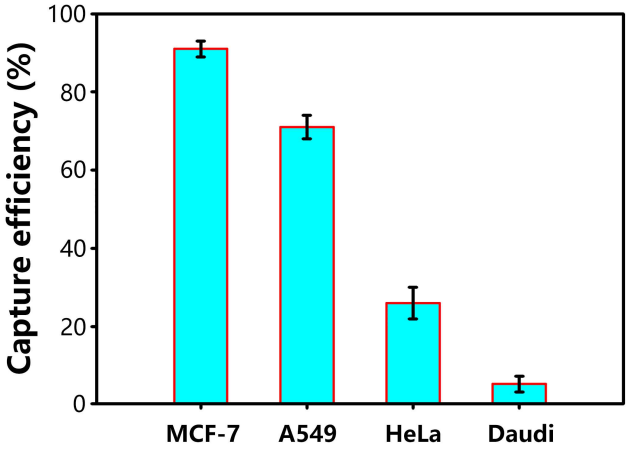

Fig. S5 Capture efficiency of EpCAM positive cell lines (MCF-7 and A549) and EpCAM negative cell lines (HeLa and Daudi) on anti-EpCAM/PDMS-1. The error bars represent one standard deviation (n=5).

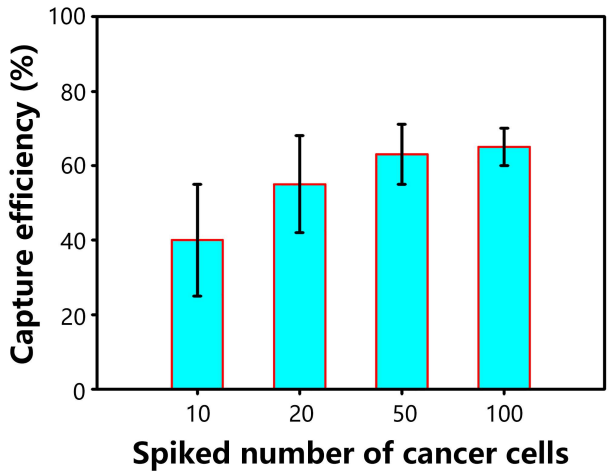

Fig. S6 Capture efficiency of spiked MCF-7 cells in the artificial whole blood on anti-EpCAM/PDMS-1. The capture efficiency is in the range of 40% to 65% when the concentrations ranging from 10 to 100 cells mL^{-1}. The error bars represent one standard deviation (n=5).

Table S1 The information of breast cancer patients.

Patient number	Cancer type	Age	Gender	TNM grouping[a]	Stage[a]	CTC number (1mL blood)
1	Breast cancer	39	Female	T1 N0 M0	I A	2
2	Breast cancer	45	Female	T4 N2 M0	III B	8
3	Breast cancer	35	Female	T1 N1 M0	II A	3
4	Breast cancer	49	Female	T4 N3 M0	III C	14
5	Breast cancer	45	Female	T1 N0 M0	I A	1
6	Breast cancer	39	Female	T1 N0 M0	I A	0
7	Breast cancer	47	Female	T1 N1 M0	II A	3
8	Breast cancer	41	Female	T1 N1 M0	II A	2
9	Breast cancer	32	Female	T1 N1mi M0	I B	2
10	Breast cancer	79	Female	T2 N1 M0	II B	4
11	Breast cancer	42	Female	T2 N2 M0	III A	6
12	Breast cancer	41	Female	T1 N2 M0	III A	5
13	Breast cancer	69	Female	T2 N1 M0	II B	4
14	Breast cancer	58	Female	T2 N0 M0	II A	0
15	Breast cancer	50	Female	T1 N1 M0	II A	1
16	Breast cancer	43	Female	T2 N2 M0	III A	2
17	Breast cancer	47	Female	T1 N0 M0	I A	0
18	Breast cancer	40	Female	T2 N1 M0	II B	5
19	Breast cancer	62	Female	T2 N2 M0	III A	7
20	Breast cancer	43	Female	T3 N0 M0	II B	6
21	Breast cancer	55	Female	T3 N0 M0	II B	2
22	Breast cancer	61	Female	T2 N2 M0	III A	3
23	Breast cancer	56	Female	T2 N2 M0	III A	6
24	Breast cancer	66	Female	T3 N0 M0	II B	3
25	Breast cancer	49	Female	T3 N1 M0	III A	5

[a] TNM staging system: The TNM Classification of Malignant Tumors (TNM) is a cancer staging notation system that gives codes to describe the stage of a person's cancer, when this originates with a solid tumor. T describes the size of the original (primary) tumor and whether it has invaded nearby tissue, N describes nearby (regional) lymph nodes that are involved, M describes distant metastasis (spread of cancer from one part of the body to another).