Supporting Information

Enhanced Capture and Release of Circulating Tumor Cells Using Hollow Glass Microspheres with Nanostructured Surface

Ziye Dong,[1] Dan Yu,[1, 2] Qingye Liu, [1, 3] Zhenya Ding,[1] Veronica J. Lyons,[4] Robert K. Bright,[5] Dimitri Pappas,[4] Xinli Liu,[6] Wei Li [1,*]

[1] Department of Chemical Engineering, Texas Tech University, Lubbock, TX, 79409
[2] Department of Critical Care Medicine, People's Hospital of Zhengzhou University (Henan Provincial People's Hospital), Zhengzhou, China, 450003
[3] School of Chemical Engineering and Technology, North University of China, Taiyuan, China, 030051
[4] Department of Chemistry and Biochemistry, Texas Tech University, Lubbock, TX, 79409
[5] Department of Immunology & Molecular Microbiology, School of Medicine & Graduate School of Biomedical Sciences, Texas Tech University Health Sciences Center, Lubbock, TX 79430
[6] Department of Pharmacological and Pharmaceutical Sciences, College of Pharmacy, University of Houston, Houston, TX, 77204

Author Information

[*] To whom correspondence and reprint requests should be addressed.

E-mail: wei.li@ttu.edu

Cancer cell isolation process

Cancer cells were detached by 0.05% trypsin/EDTA and spiked in blood samples. The spiked blood and ^{NS}HGMSs were then distributed in 0.5 mL low binding Eppendorf tubes (0.1 mL per tube). After rotation on a Hula mixer, the Eppendorf tubes were flipped and allowed to stand for 5 min. All ^{NS}HGMSs floated toward to tip of Eppendorf tube and uncaptured cells sank down because of gravity. The blood cells and uncaptured cancer cells were transferred to a 96 well plate. Then the ^{NS}HGMSs were collected by pipet with low binding pipet tips to a silane-treated PDMS microwell (hydrophobic surface) where a cover slide was used to cover the top surface of liquid to evenly distribute ^{NS}HGMSs. Therefore, all ^{NS}HGMSs floated at the same height and can be counted under a microscope. Also, uncaptured cancer cells in the 96 well plate were counted under a microscope. The total number spiked cancer cells (m+n) was calculated by adding up the number of captured cancer cells from the PDMS microwell (m) and uncaptured cancer cells from the 96 well plate (n).

$$\text{Capture efficiency} = \frac{\text{Number of captured cancer cells } (m)}{\text{Total number of spiked cancer cells } (m+n)}$$

Supplementary Figures

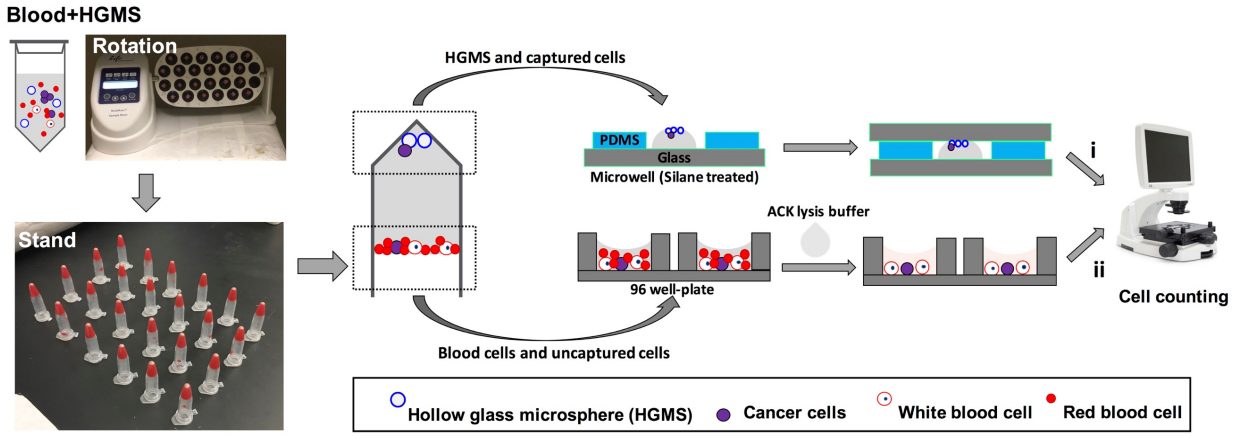

Fig. S1. Diagram of cancer cell isolation process.