Electronic Supplementary Material (ESI) for Nanoscale.
This journal is © The Royal Society of Chemistry 2021

Electronic Supplementary Information

Engineered multifunctional metal-phenolic nanocoatings for label-free capture and "self-release" of heterogeneous circulating tumor cells

Yiling Liu,[a] Xiaoshan Wang,[b] Yuwei Zhou,[a] Guang Yang,[c] Jianwen Hou*[a] and Shaobing Zhou*[a]

[a] *Key Laboratory of Advanced Technologies of Materials, Ministry of Education, School of Materials Science and Engineering, Southwest Jiaotong University, Chengdu, 610031, PR China*

[b] *Cancer Center, Sichuan Academy of Medical Sciences & Sichuan Provincial People's Hospital, School of Medicine, University of Electronic Science and Technology of China, Chengdu, 610072, PR China*

[c] *College of Medicine, Southwest Jiaotong University, Chengdu 610031, China.*

Corresponding author: houjianwen@swjtu.edu.cn, shaobingzhou@swjtu.edu.cn

Table of Contents

1. Supplementary Figures:

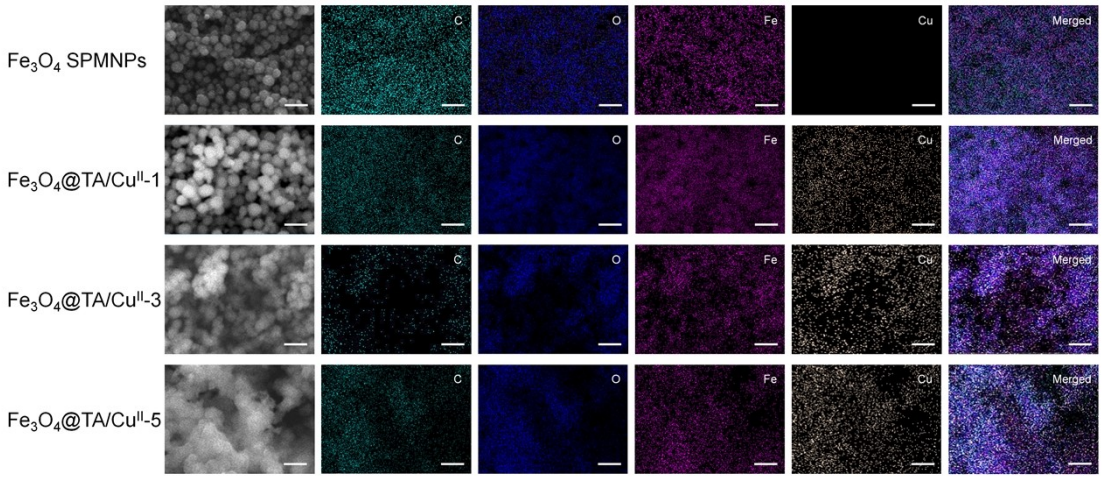

Figure S1. EDS elemental mapping of different nanoparticles. The scale bar is 1 μm.

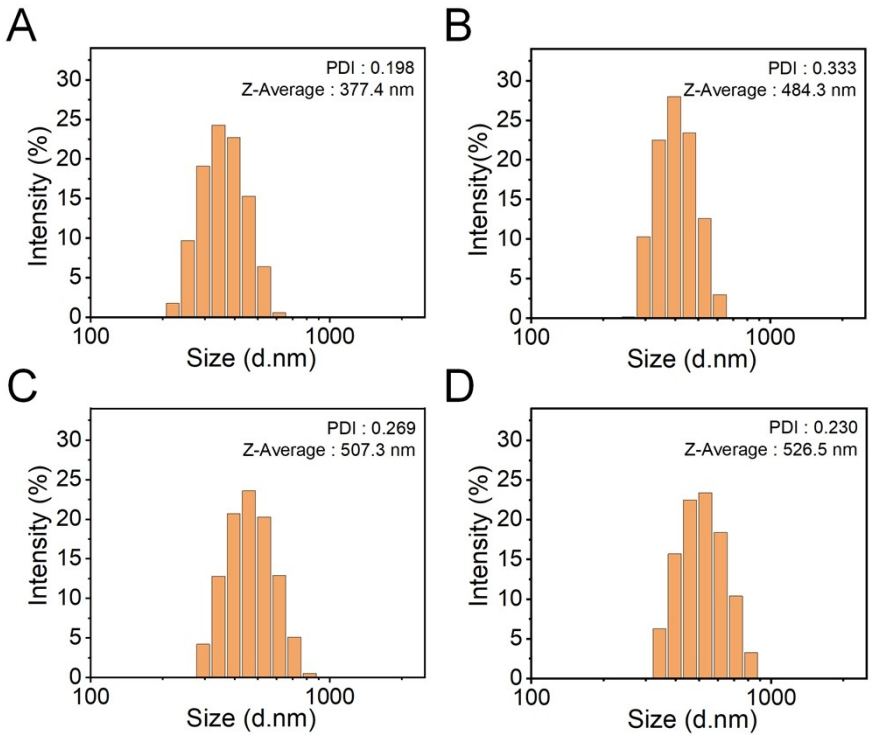

Figure S2. Hydrodynamic size of (A) Fe_3O_4, (B) Fe_3O_4@TA/Cu^{II}-1, (C) Fe_3O_4@TA/Cu^{II}-3 and (D) Fe_3O_4@TA/Cu^{II}-5 SPMNPs.

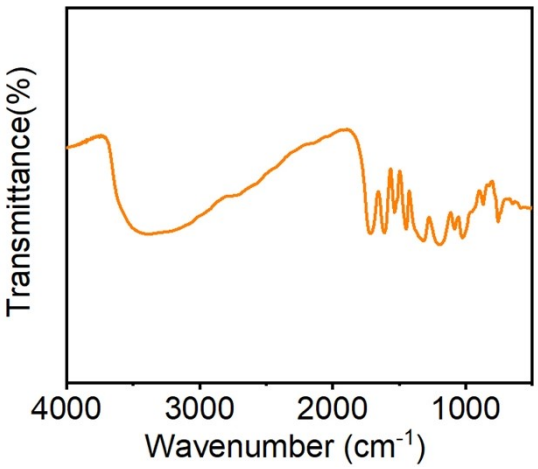

Figure S3. FTIR spectrum of TA.

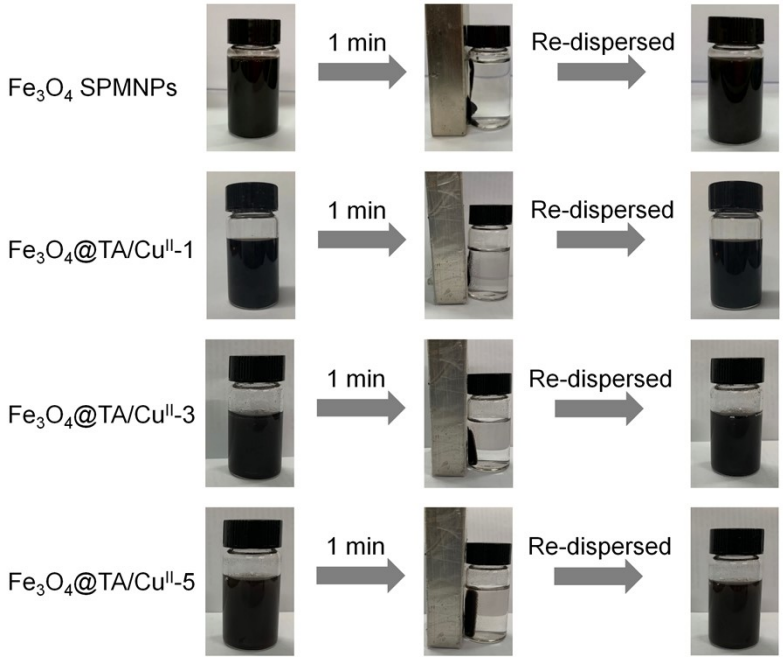

Figure S4. Typical photographs showing the magnetic response and dispersion performance of different nanoparticles.

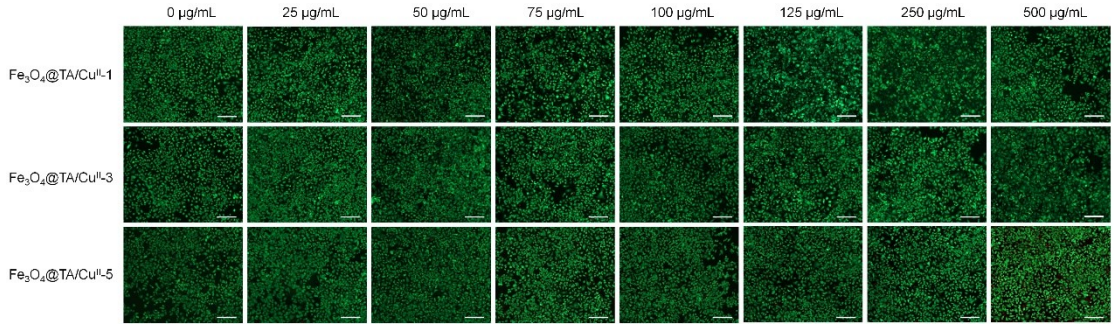

Figure S5. Fluorescence images showing the viability of MCF-7 cells following treatment with different concentrations of Fe_3O_4@TA/Cu^{II} SPMNPs for 24 h. Green calcein AM fluorescence and red PI fluorescence indicating live and dead cells, respectively. The scale bar is 200 µm.

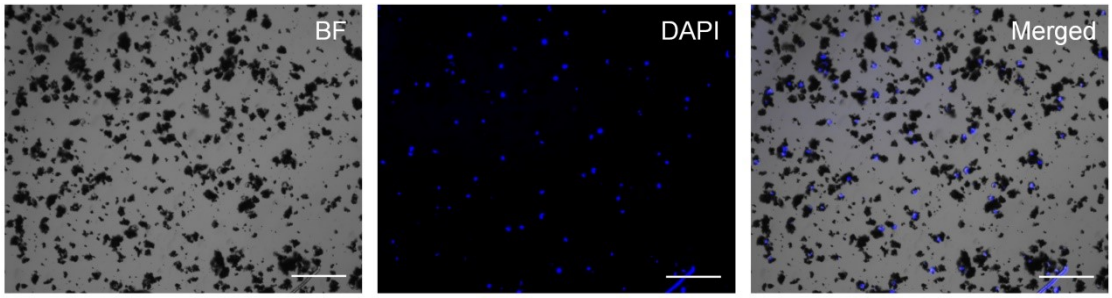

Figure S6. Bright field (BF), fluorescent and merged image of MCF-7 cells captured by Fe_3O_4@TA/Cu^{II}-3 SPMNPs. The scale bar is 200 μm.

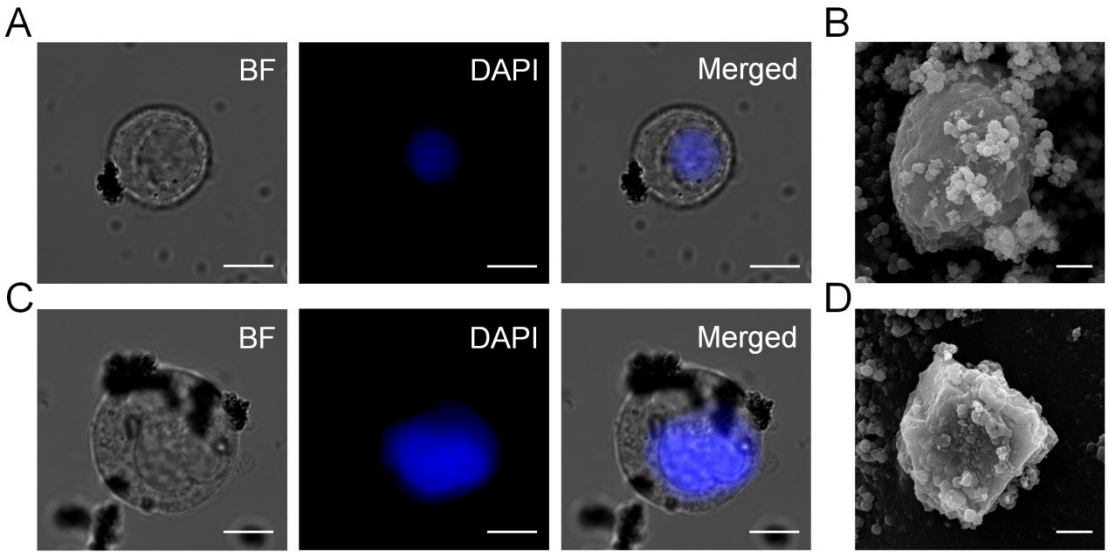

Figure S7. Bright field, fluorescent and merged images of single MCF-7 cell captured by (A) Fe_3O_4@TA/Cu^{II}-1 and (C) Fe_3O_4@TA/Cu^{II}-5 SPMNPs stained with DAPI. The scale bar is 10 μm. SEM image showing single MCF-7 cell captured by (B) Fe_3O_4@TA/Cu^{II}-1 and (D) Fe_3O_4@TA/Cu^{II}-5 SPMNPs. The scale bar is 2 μm.

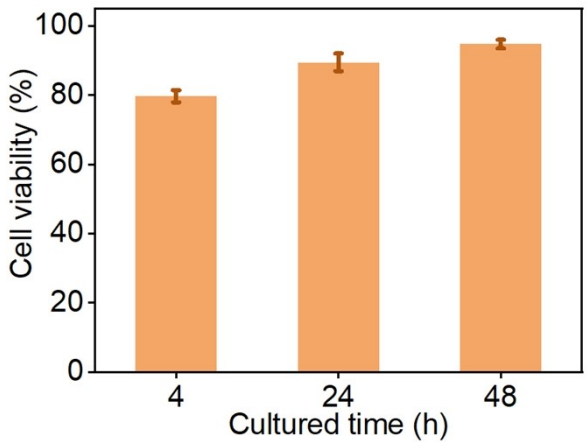

Figure S8. Cell viability of released cells after different culture time. All bars represent means ± SD (n=3).

2. Supplementary Tables:

Table S1. Basic information of cancer patients.

Sample No.	Cancer Type	Gender	Age	Volume processed/mL	CTCs
1	breast	female	49	1	1
2	breast	female	53	1	13
3	peritoneal	female	48	1	6
4	peritoneal	male	5	1	2
5	colorectal	female	57	1	1
6	gastric	male	64	1	3
7	lung	male	70	1	2
8	lung	male	33	1	1
9	lung	male	57	1	5
10	lung	female	56	1	6
11	lung	male	54	1	4
12	lung	male	62	1	3
13	lung	male	67	1	1
14	renal	male	57	1	9

Table S2. Basic information of healthy donors.

Sample No.	Gender	Age	Volume processed/mL	CTCs
1	female	25	1	0
2	male	33	1	0
3	female	26	1	0