Supporting Information

In Vivo Tumor Vasculature Targeted PET/NIRF Imaging with TRC105(Fab)-conjugated, Dual-labeled Mesoporous Silica Nanoparticles

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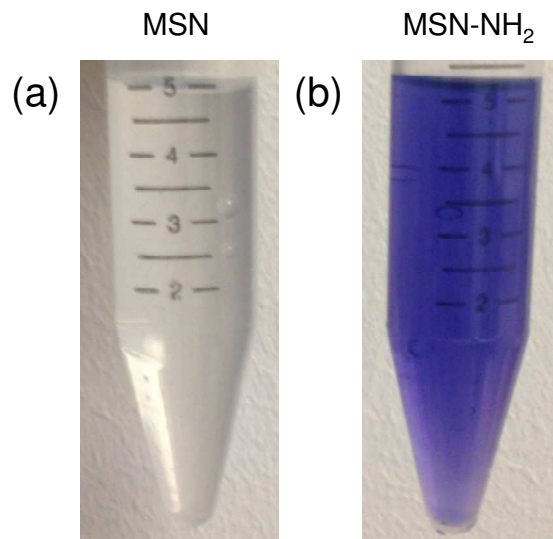
Supplementary Figures and Tables

MSN   MSN-NH$_2$

(a)   (b)

Figure S1. Ninhydrin testing of (**a**) pure MSN and (**b**) MSN-NH$_2$.

Table S1. PET ROI quantifications of ^{64}Cu-MSN-800CW-TRC105 (targeted group).

Targeted group (n = 3)	0.5 h (%ID/g)	4 h (%ID/g)	14 h (%ID/g)	24 h (%ID/g)	48 h (%ID/g)
Liver	23.2 ± 3.5	19.5 ± 2.2	12.7 ± 1.0	11.7 ± 0.8	9.2 ± 0.6
Tumor	5.5 ± 0.4	5.4 ± 0.2	3.9 ± 0.1	3.9 ± 0.1	3.3 ± 0.3
Blood	4.6 ± 0.6	3.2 ± 0.2	3.0 ± 0.1	2.2 ± 0.4	2.0 ± 0.2
Muscle	1.0 ± 0.0	0.7 ± 0.1	0.7 ± 0.0	0.8 ± 0.1	0.8 ± 0.0

Table S2. PET ROI quantifications of ^{64}Cu-MSN-800CW-TRC105 (non-targeted group).

Non-targeted group (n = 3)	0.5 h (%ID/g)	4 h (%ID/g)	14 h (%ID/g)	24 h (%ID/g)	48 h (%ID/g)
Liver	20.9 ± 1.2	19.4 ± 0.7	16.2 ± 0.6	13.8 ± 0.2	10.5 ± 1.0
Tumor	2.1 ± 0.2	2.4 ± 0.3	2.1 ± 0.3	2.0 ± 0.3	1.7 ± 0.1
Blood	3.3 ± 0.5	3.1 ± 0.5	2.9 ± 0.8	2.6 ± 0.6	2.4 ± 0.5
Muscle	0.8 ± 0.1	0.7 ± 0.0	0.7 ± 0.0	0.7 ± 0.0	0.6 ± 0.0

Table S3. PET ROI quantifications of ^{64}Cu-MSN-800CW-TRC105 (blocking group).

Blocking group (n = 3)	0.5 h (%ID/g)	4 h (%ID/g)	14 h (%ID/g)	24 h (%ID/g)	48 h (%ID/g)
Liver	22.8 ± 4.8	17.2 ± 2.4	13.2 ± 1.1	12.4 ± 1.4	10.2 ± 0.8
Tumor	2.9 ± 0.5	2.3 ± 0.2	2.1 ± 0.1	2.0 ± 0.1	1.7 ± 0.2
Blood	3.7 ± 0.6	3.1 ± 0.6	2.9 ± 0.6	2.7 ± 0.6	2.2 ± 0.4
Muscle	1.1 ± 0.3	0.8 ± 0.1	0.8 ± 0.1	0.8 ± 0.1	0.9 ± 0.1

Table S4. Summary of tumor-to-organ ratios in targeted group.

Targeted group (n = 3)	0.5 h	4 h	14 h	24 h	48 h
T/M	5.2 ± 0.2	7.3 ± 1.1	5.3 ± 0.3	4.9 ± 0.6	4.1 ± 0.3
T/B	1.2 ± 0.2	1.7 ± 0.1	1.3 ± 0.0	1.8 ± 0.3	1.6 ± 0.2
T/L	0.2 ± 0.0	0.3 ± 0.0	0.3 ± 0.0	0.3 ± 0.0	0.4 ± 0.0

Table S5. Summary of tumor-to-organ ratios in non-targeted group.

Non-targeted group (n = 3)	0.5 h	4 h	14 h	24 h	48 h
T/M	2.6 ± 0.1	3.1 ± 0.5	3.1 ± 0.4	3.0 ± 0.6	2.7 ± 0.2
T/B	0.6 ± 0.1	0.8 ± 0.0	0.7 ± 0.1	0.8 ± 0.1	0.7 ± 0.1
T/L	0.1 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.2 ± 0.0

Table S6. Summary of tumor-to-organ ratios in blocking group.

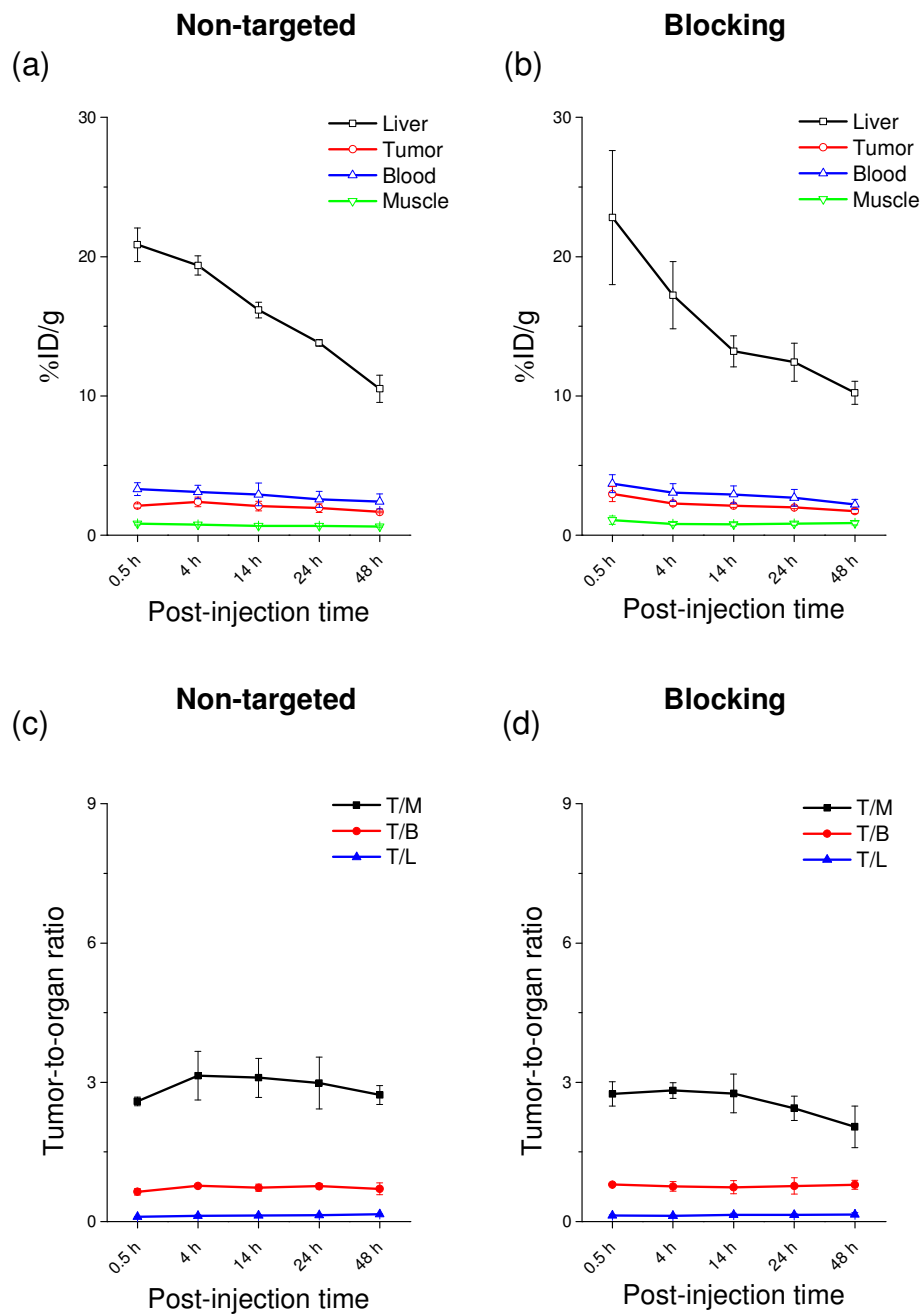| Blocking group (n = 3)	0.5 h	4 h	14 h	24 h	48 h
T/M	2.8 ± 0.3	2.8 ± 0.2	2.8 ± 0.4	2.4 ± 0.3	2.0 ± 0.4
T/B	0.8 ± 0.0	0.8 ± 0.1	0.7 ± 0.1	0.8 ± 0.2	0.8 ± 0.1
T/L	0.1 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.2 ± 0.0

Figure S2. Quantitative analysis of the PET data. Time-activity curves of the liver, 4T1 tumor, blood, and muscle upon intravenous injection of (**a**) non-targeted group: ^{64}Cu-MSN-800CW, and (**b**) blocking group: ^{64}Cu-MSN-800CW-TRC105(Fab) after a blocking dose of TRC105 (1 mg/mouse). Time-activity curves of tumor-to-muscle (T/M), tumor-to-blood (T/B) and tumor-to-liver (T/L) ratios of (**c**) non-targeted group and (**d**) blocking group.