Electronic Supplementary Material (ESI) for Nanoscale.

SUPPLEMENTARY INFORMATION:

Dual-radiolabeled nanoparticle SPECT probes for bioimaging

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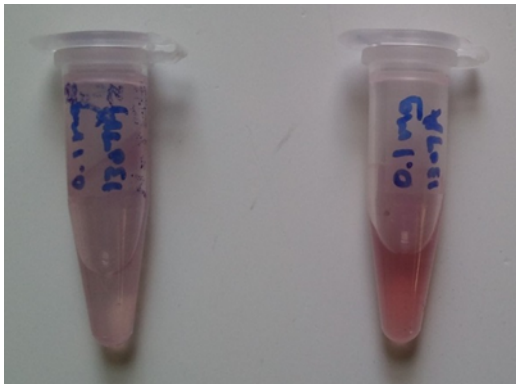

Figure S1. Image of gold nanoparticle suspensions after incubation with the synthesized peptide both (left) without and (right) with the addition of mPEG-SH (MW5000). The red color associated with the surface plasmon resonance of a well-dispersed suspension was only preserved with addition of PEG.

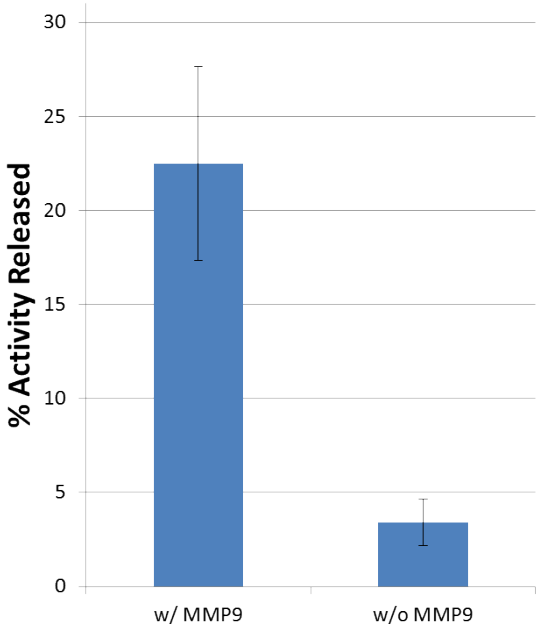

Figure S2. Quantification of MMP9 activity with the multifunctional nanoparticle (NP). The bars represent the percent of total activity that was found in the supernatant solution after 1.5 hour incubation with MMP9. Error bars represent standard deviation of a triplicate experiment.

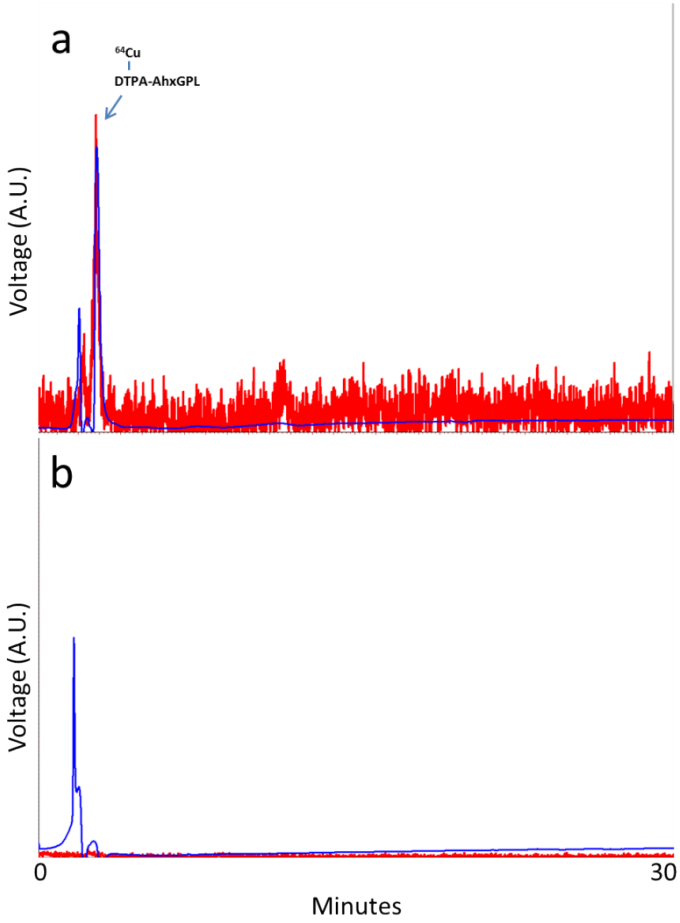

Figure S3. High performance liquid chromatography of supernatant solutions after incubation of ^{64}Cu-labeled nanoparticles (a) with MMP9 or (b) without MMP9.

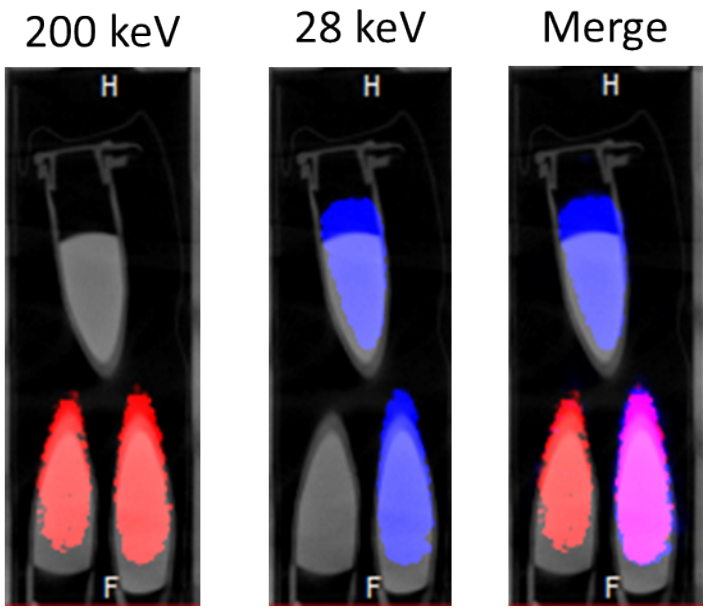

Figure S4. SPECT phantom study with dual-radiolabeled nanoparticles (bottom right vial), along with ^{111}In control (bottom left vial) and ^{125}I control (top vial). X-ray CT of vials along with 200 keV energy SPECT channel (left panel), 28 keV energy SPECT channel (middle panel), and merged energy SPECT channels (right panel).

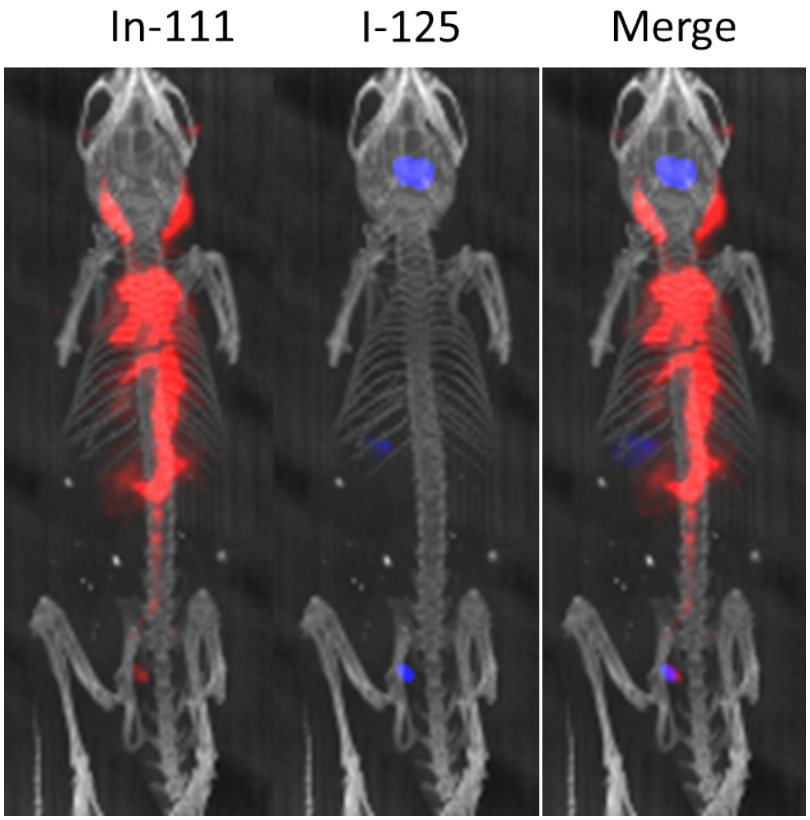

Figure S5. SPECT/CT imaging of mice 4 hours after injection with the dual-radiolabeled nanoparticles. X-ray CT can be seen with (left panel) 200 keV SPECT channel, (middle panel) 28 keV SPECT channel, and (right panel) merged energy SPECT channels.

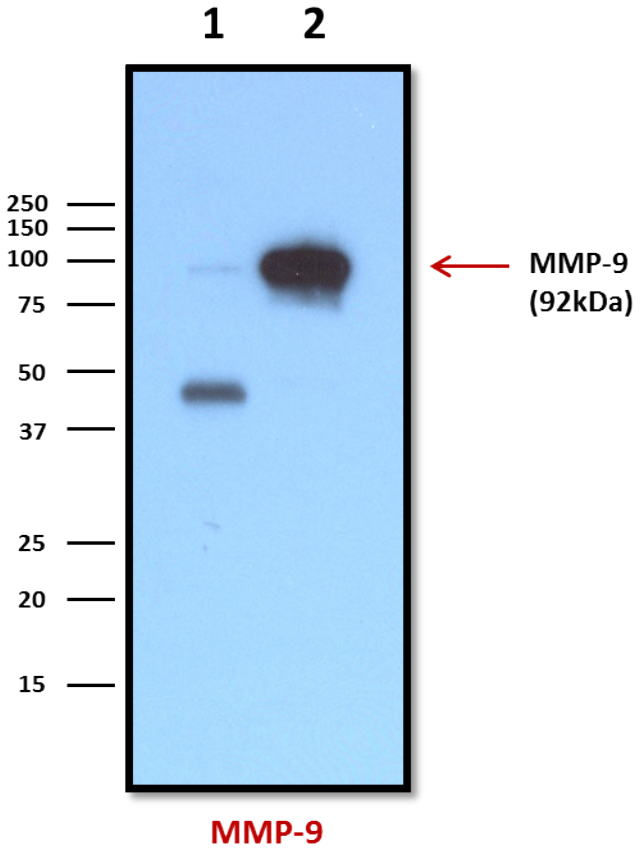

Figure S6. Western blot for MMP-9 of (1) 4T1Luc and (2) A431 cells used to grow *in vivo* tumors.

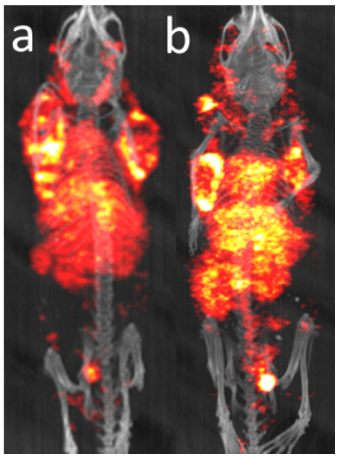

Figure S7. SPECT/CT imaging of (a) A431 tumor-bearing and (b) 4T1Luc-tumor bearing mice 24 hours after injection using the 200 keV energy channel.

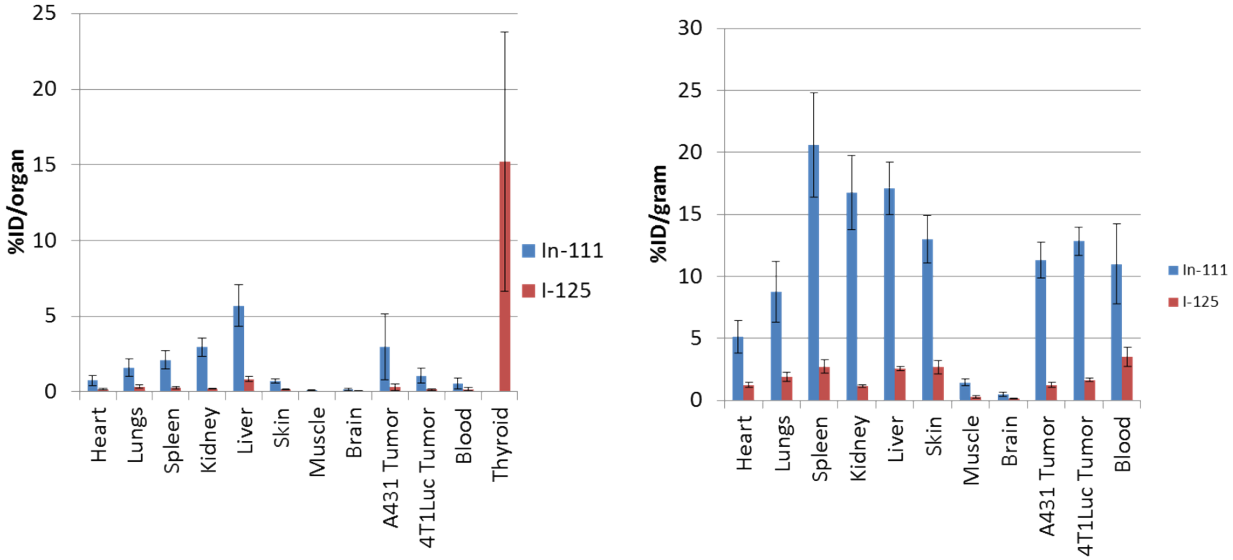

Figure S8. Biodistibution from mice sacrificed after the 48 hour imaging time point. Error bars represent standard deviation of organ and tumor values (n = 4-6).