Matrix metalloproteinase-triggered denuding of engineered gold nanoparticles for selective cell uptake

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Figure S1. Characterization of the gold nanoparticles. (A) UV-vis spectroscopy measurement of the gold nanoparticles. Dark-field (B) and transmission electron microscopy (C) images of the gold nanoparticles. Histogram plot of the gold nanoparticles size distribution analyzed from the TEM images (D).



Figure S2. Characterization of the various Au-conjugate controls. (A) UV-vis spectra of the various positive and negative control samples used in our studies. Field flow fractionation analysis of the various Au-conjugates. PEG-AuNPs (B), non-cleavable AuNPs before (C) and after exposure to MMP-2 (D). (E) Box plot analysis of the hydrodynamic size distributions (nm) of the different AuNP conjugates obtained from dynamic light scattering measurements.



Figure S3. Thermogravimetric analysis (TGA) of the cleavable-AuNP conjugates shown in the form of percent (%) weight loss against a range of temperatures.



Figure S4. *In Vitro* cyctoxicity evaluation for various AuNPs control samples. (A) Cell viability as measured by MTS assay. LIVE/DEAD staining and imaging for cells treated with (B) AuNPs, (C) PEG- AuNPs and, (D) non-cleavable AuNPs in the absence and (E) presence of MMP-2. Green fluorescence indicates live cells, and compromised cells are stained red. The error bars indicate the standard deviation. * p<0.05 relative to control.



Figure S5. Hyperspectral mapping of dark-field microscopy images of the MDA-MB-231 untreated control cells (A) and the cells treated with the various conjugates; PEG-AuNPs (B), non-cleavable AuNPs before (C) and after (D) treatment with MMP-2 [15 μ g/mL]. Red indicates hyperspectral mapping of AuNPs.



Figure S6. TEM images of the MDA-MB-231 control cells (A and B) and the cells treated with the PEG-AuNPs (C and D), non-cleavable AuNPs alone (E and F) and in the presence of MMP-2 (G and H) at increasing magnifications.

Table S1. Viability analysis of MDA-MB-231 cells treated with various AuNP conjugates obtained from confocal microscopy images using Image J (Version 1.4.3) software.

MDA-MB-231 cells

Sample	Dead Cells (Red)	Live Cells (Green)	Total cells
Cells Alone	3	144	147
Cells+AuNPs	11	134	145
Cells+PEG-AuNPs	5	194	199
Cells+cleavable AuNPs (-MMP-2)	10	183	193
Cells+cleavable AuNPs (+MMP-2)	7	136	143
Cells+non-cleavable AuNPs (-MMP-2)	10	250	260
Cells+non-cleavable AuNPs (+MMP-2)	9	174	183