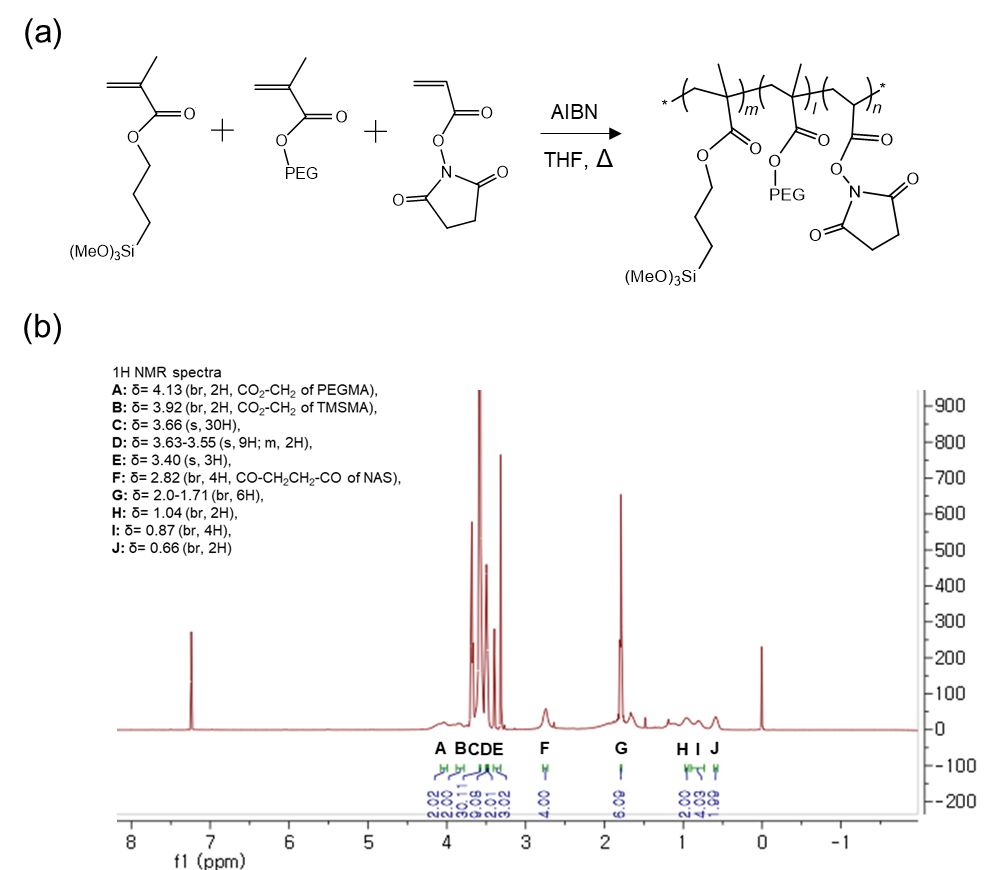
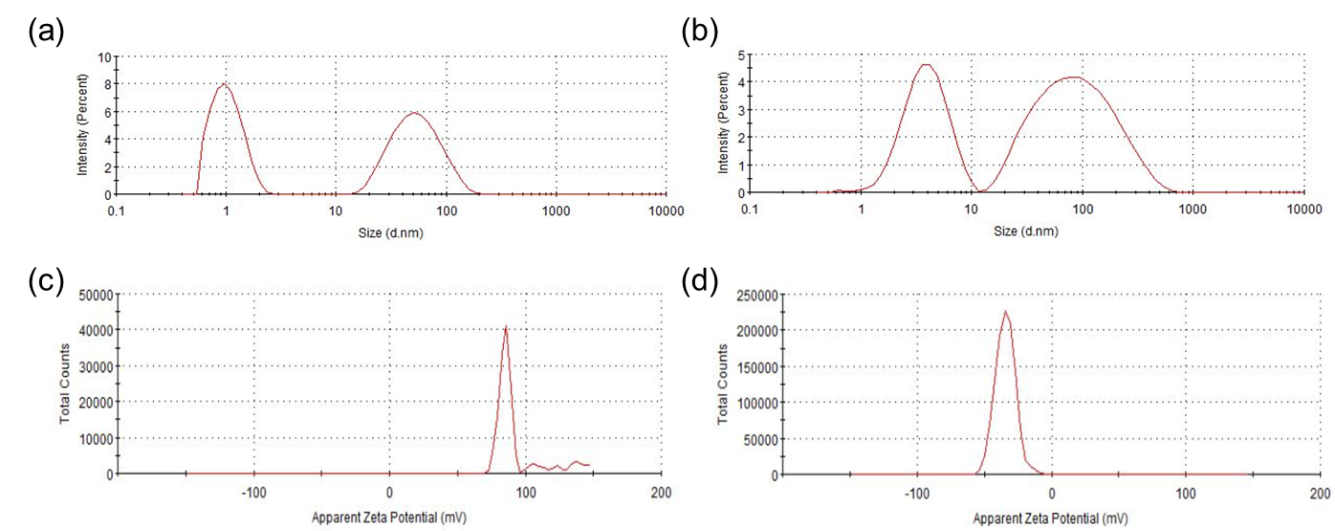
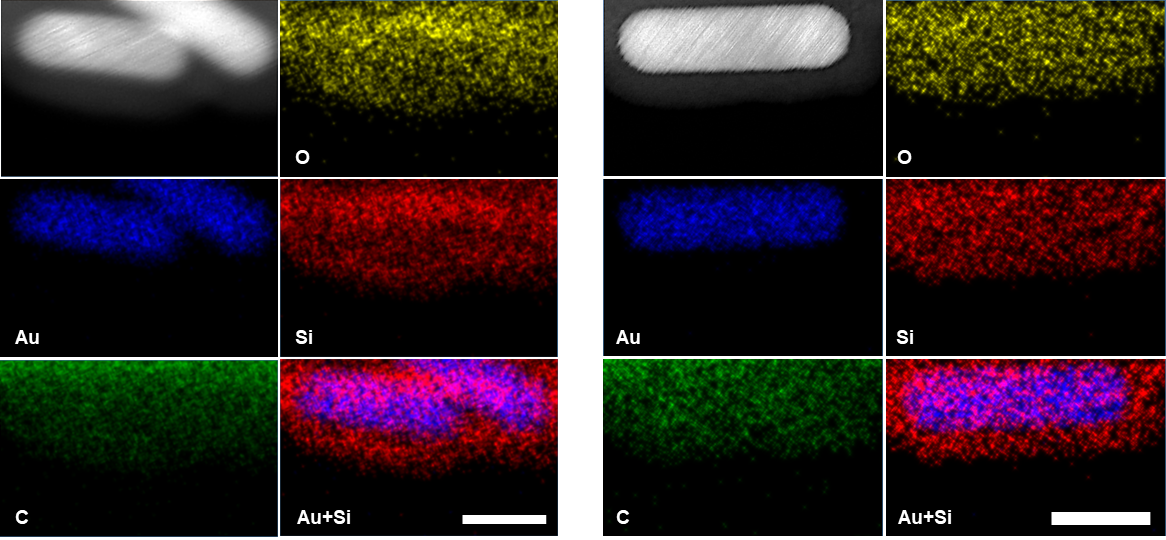
# Supplementary Figures



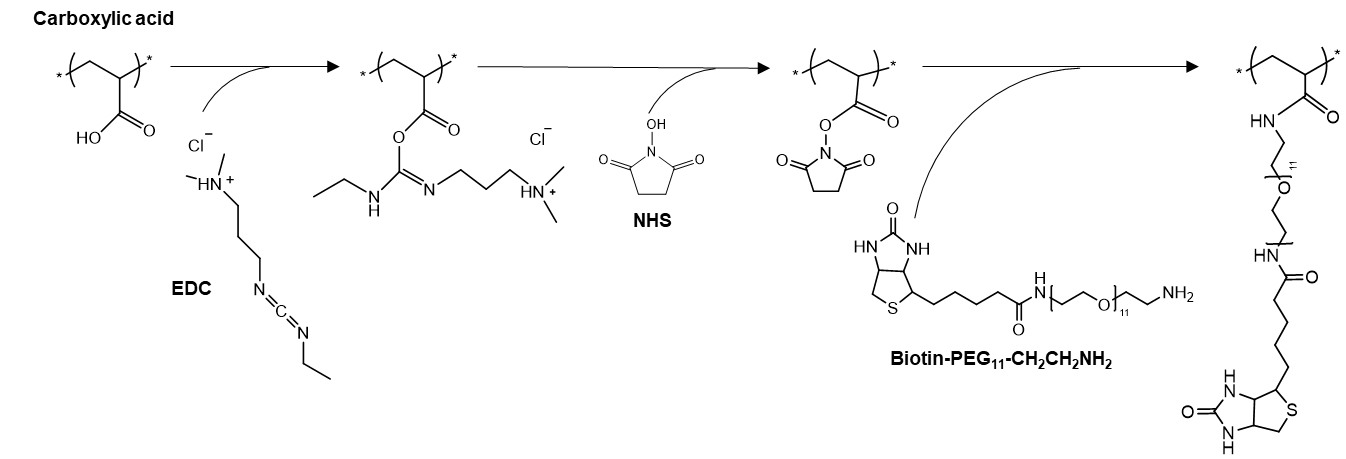
**Figure S1.** Synthesis of poly(TMSMA-*r*-PEGMA-*r*-NAS) (a) and its 1H NMR spectra (b).

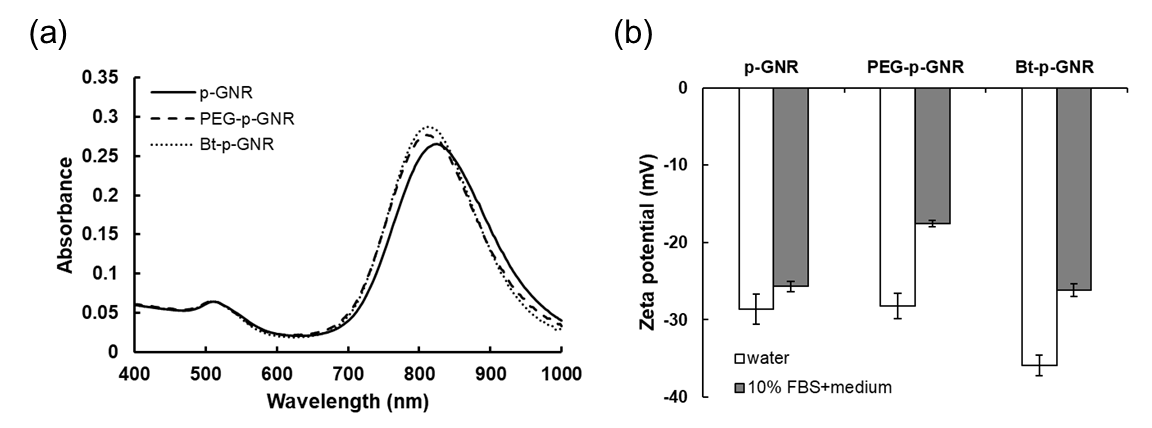


**Figure S2.** DLS size (a, b) and zeta potential (c, d) measurements of CTAB-GNRs (a, c) and p-GNRs (b, d).

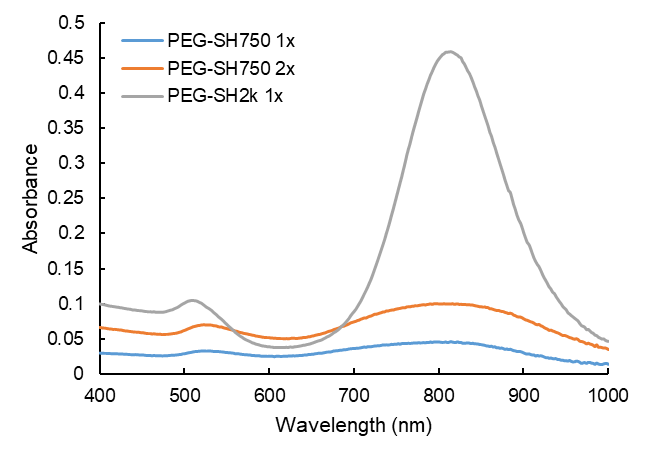


**Figure S3.** TEM-EDS mapping images of p-GNRs for Au, C, O, and Si. Scale bars, 20 nm.

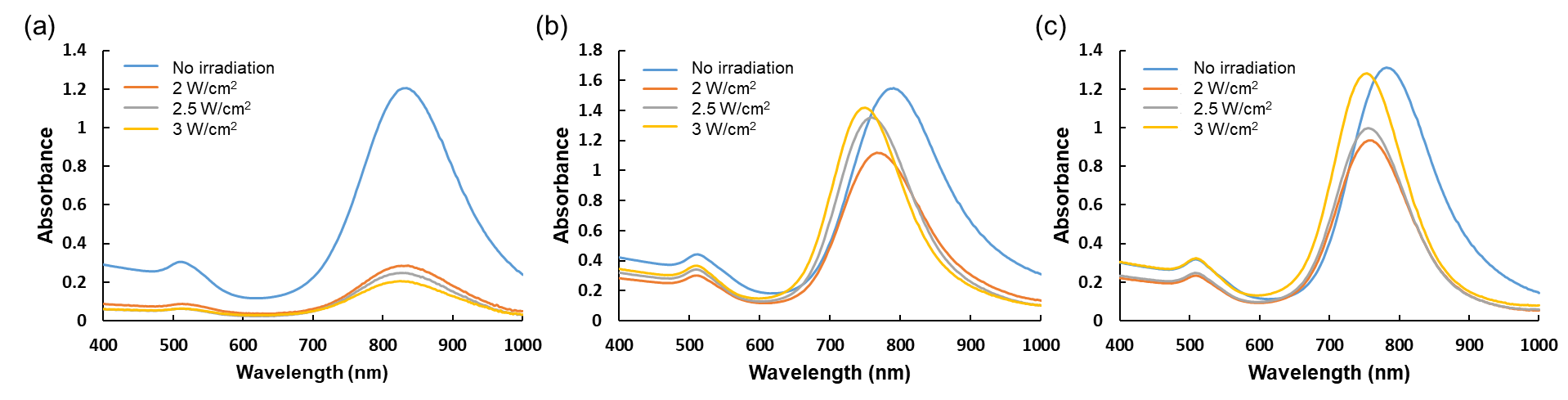
**Figure S4.** Synthesis of biotin functionalization on p-GNRs via a DC/NHS amine coupling reaction.



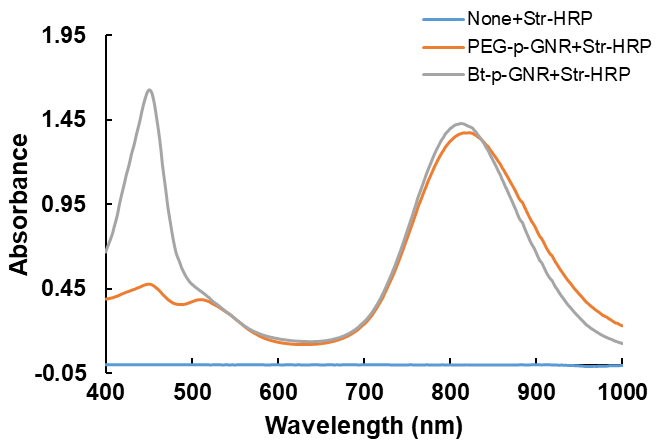
**Figure S5.** (a) Absorbance spectra of p-GNRs, PEG-p-GNRs, and Bt-p-GNRs. (b) Zeta potentials of p-GNRs, PEG-p-GNRs, and Bt-p-GNRs that had been incubated in water or 10% FBS+medium for 4 h. Data are presented as means ± SD (*n =* 3).

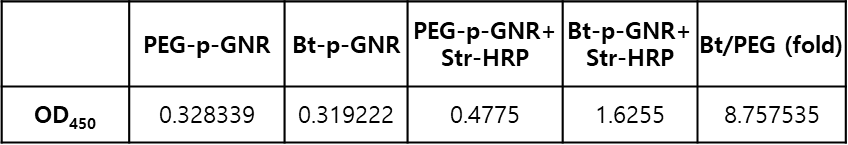


**Figure S6.** Absorbance spectra of GNRs that had been PEGylated with either thiol-mPEG750 or thiol-mPEG2k.

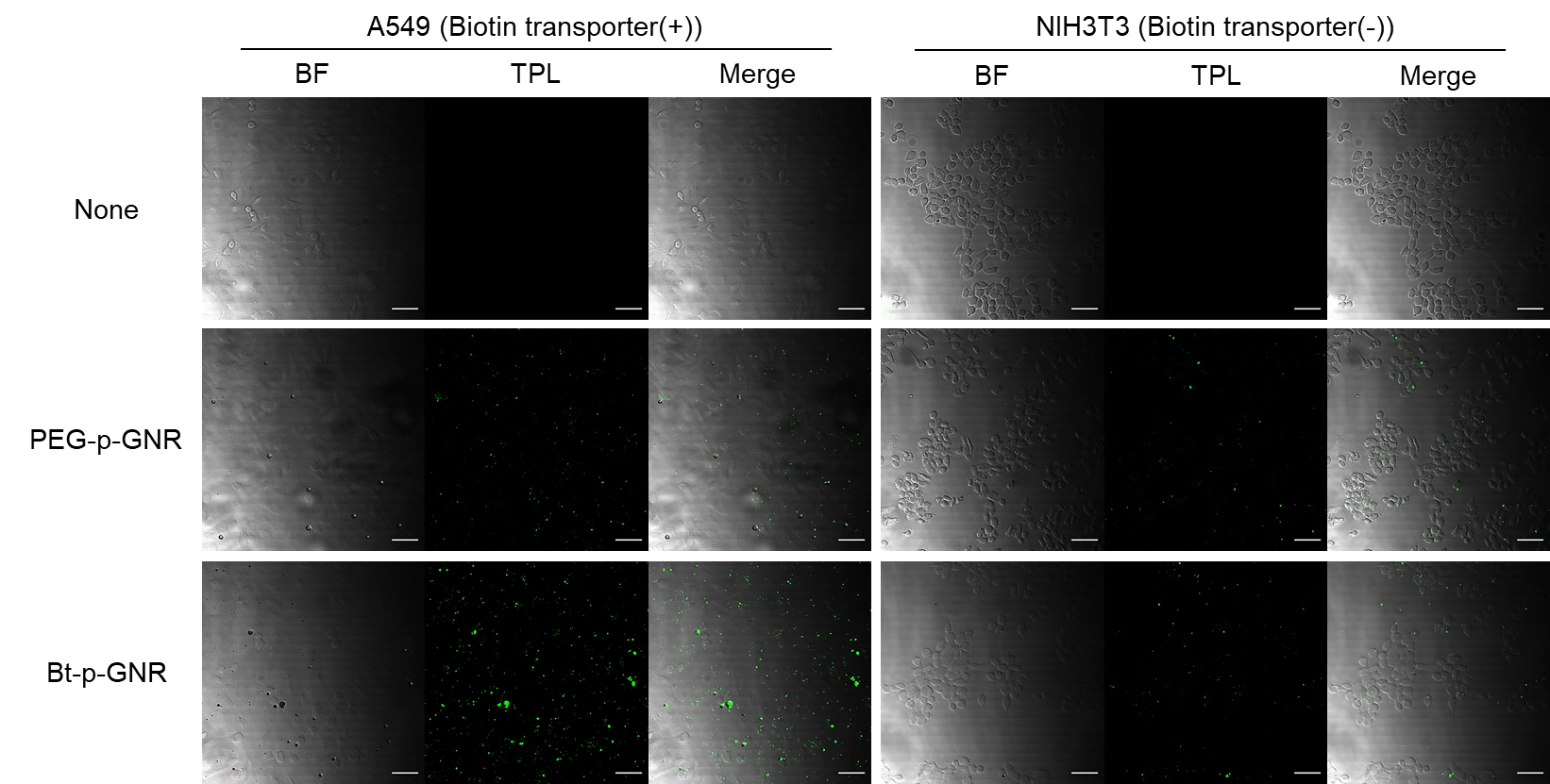


**Figure S7.** Photothermal stability of PEG2k-S-GNRs (a), p-GNRs (b), and Bt-p-GNRs (c) after irradiation for 5 min with an 808-nm laser at various intensities (2–3 W/cm2).

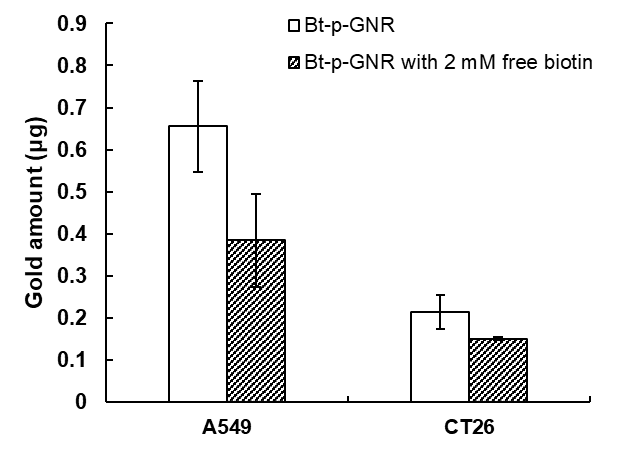




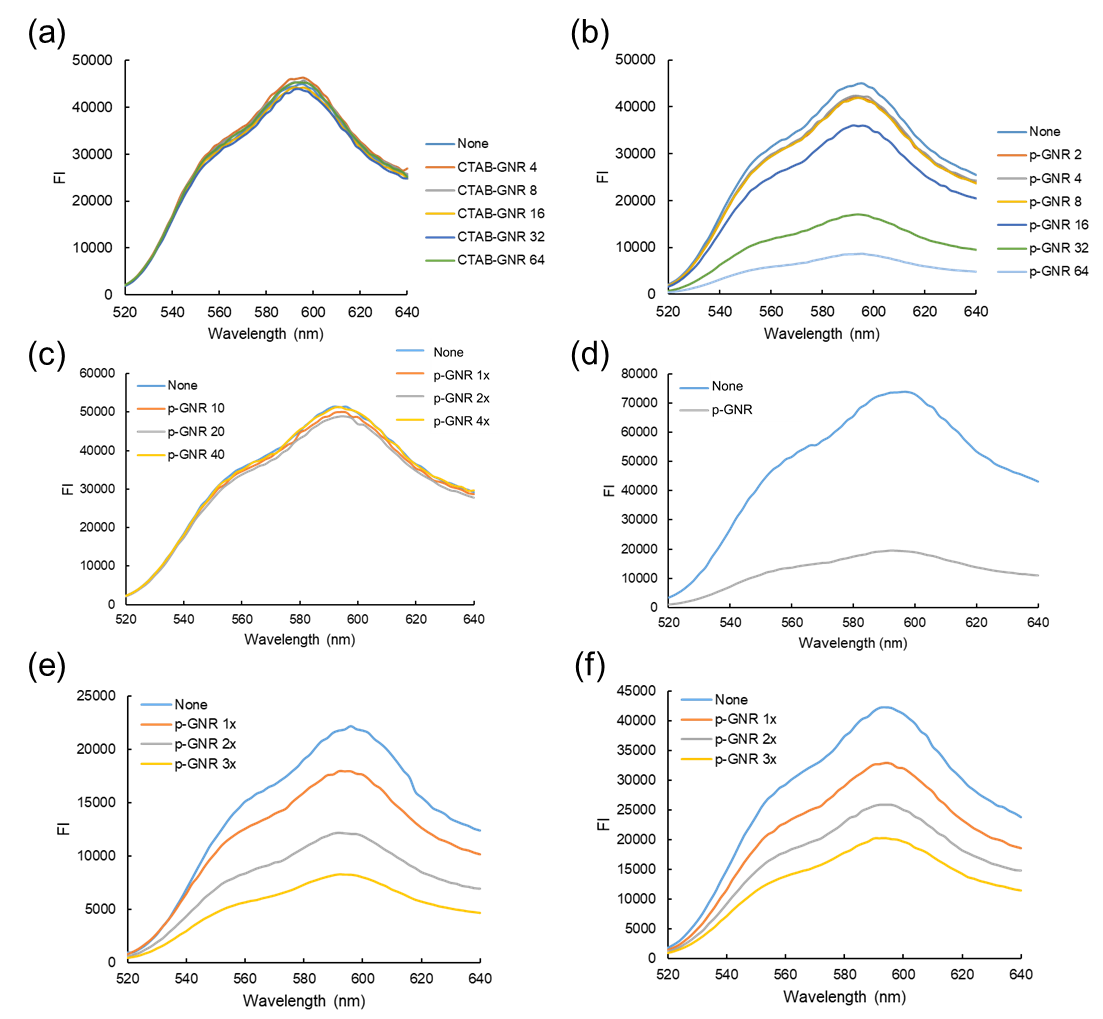
**Figure S8.** TMB coloration was measured after incubation of streptavidin-HRP with PEG-p-GNRs or Bt-p-GNRs for the detection of specific binding between streptavidin and biotin on Bt-p-GNRs.

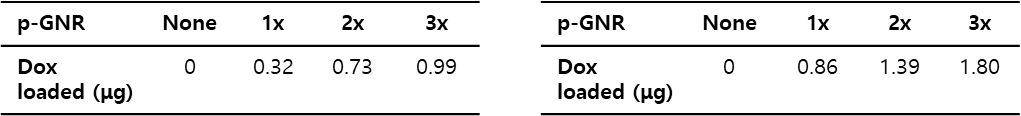


**Figure S9.** Bright field (BF) and TPL microscopy images of A549 and NIH3T3 cells that had been treated with PEG-p-GNRs or Bt-p-GNRs for 4 h (excitation, 810 nm). Scale bars, 50 μm.

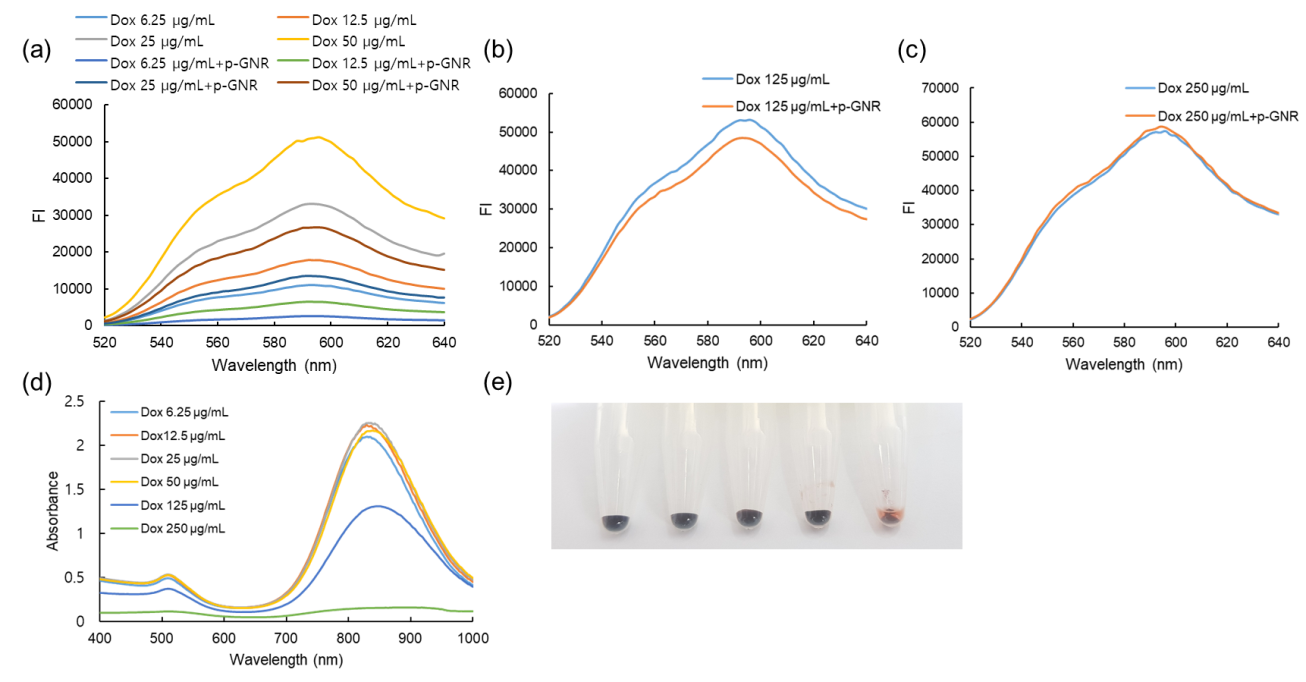


**Figure S10.** Cellular uptake of Bt-p-GNRs in the absence or presence of excess free biotin was compared using ICP-OES. Data are presented as means ± SD (*n =* 3).





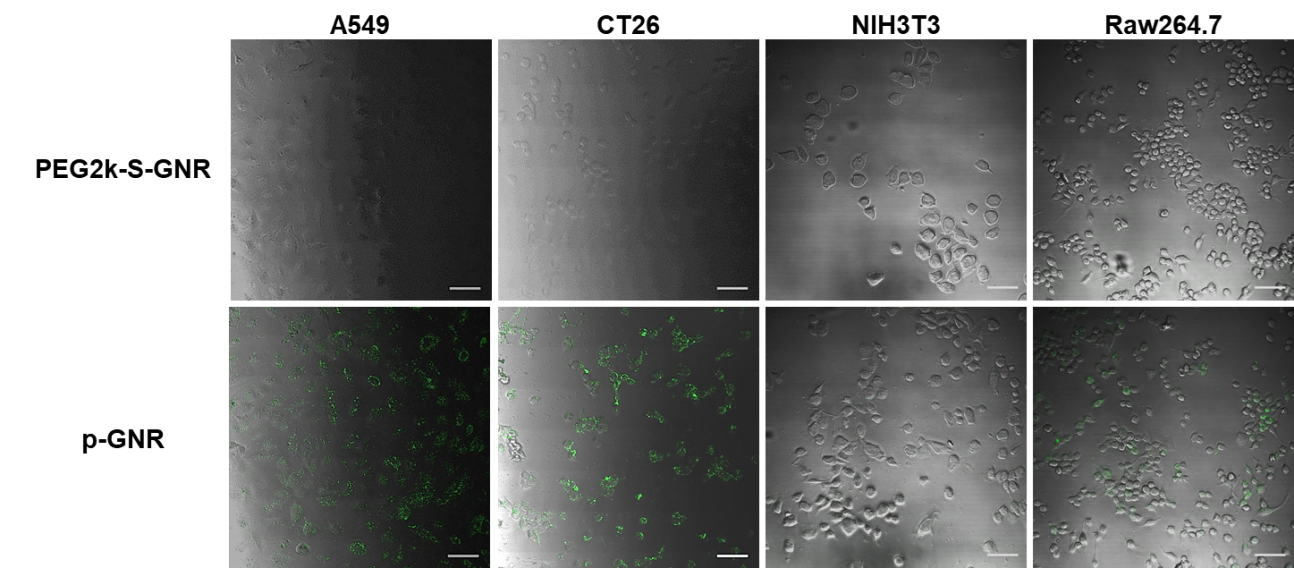
**Figure S11.** (a-d) Dox loading with CTAB-GNRs (a), base-catalyzed p-GNRs (b), acid-catalyzed p-GNRs washed with water (c), or acid-catalyzed p-GNRs washed with borate buffer (pH 8.5), tested at a constant Dox concentration (d). (e, f) The amount of Dox loaded on acid-catalyzed p-GNRs washed with borate buffer was tested at Dox concentrations of 25 μg/mL (e) and 50 μg/mL (f).



**Figure S12.** Dox loading tested with different Dox concentrations at a constant p-GNR concentration.



**Figure S13.** Dox loading tested with Bt-p-GNRs.



**Figure S14.** Cellular uptake of PEG2k-S-GNRs and p-GNRs in cancer (A549, CT26), fibroblast (NIH3T3), and macrophage (Raw264.7) cell lines (excitation, 810 nm). Scale bars, 50 μm.