Core-Shell Nanoparticles as an Efficient, Sustained and Triggered Drug Delivery System

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Supporting Information

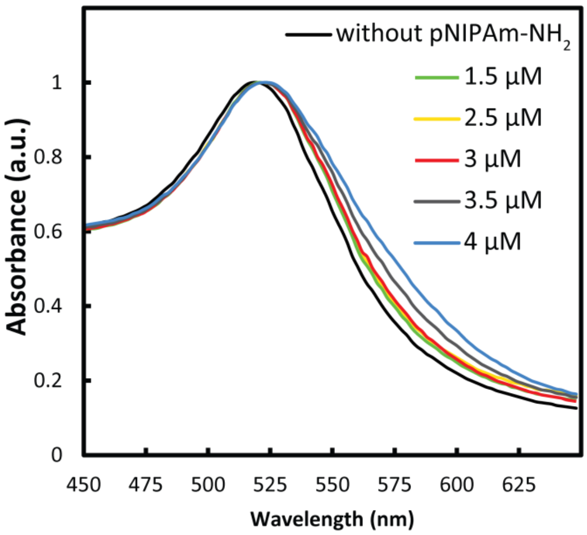

Figure S1: Optimization of the concentration of amine terminated poly-*N*-ispropylacrylamide for coating the AuNPs without any aggregation.

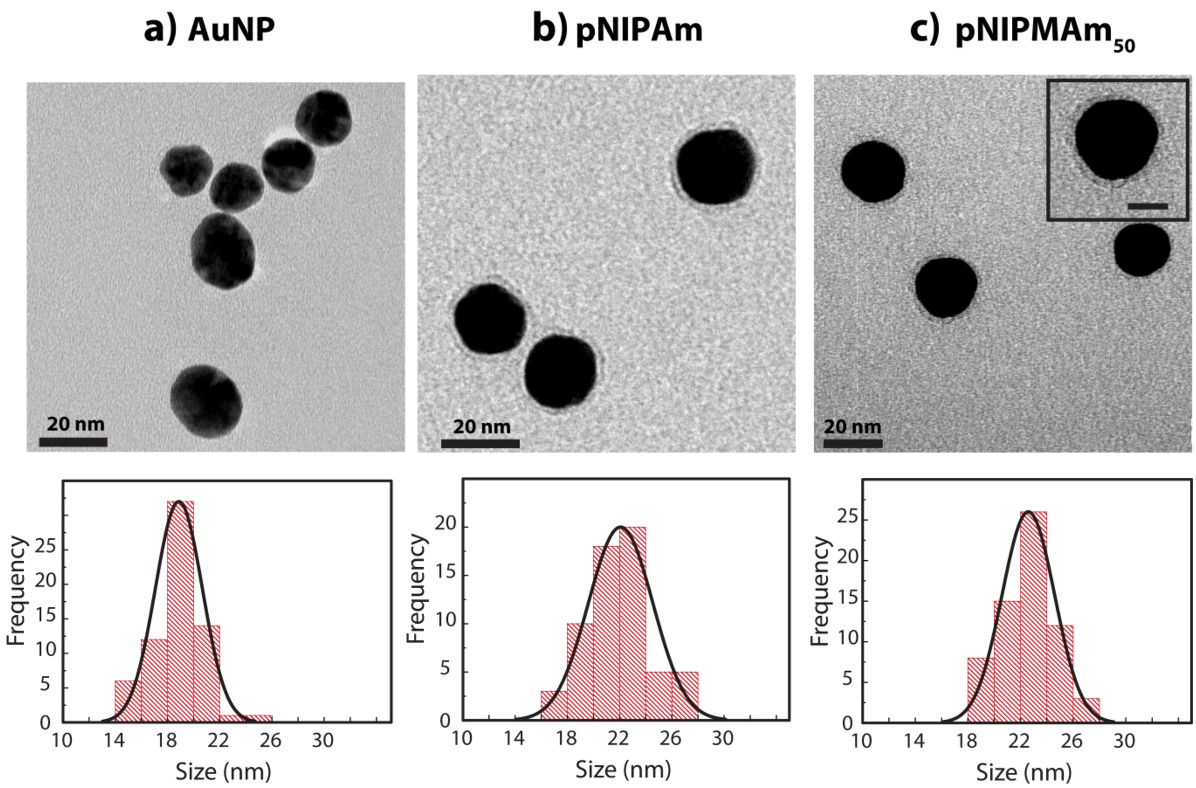

Figure S2: Transmission electron micrographs and size distribution analysis of a) AuNPs, b) pNIPAm and c) $pNIPMAm_{50}$ nanoparticles. AuNPs: gold nanoparticles; pNIPAm: AuNP core with pNIPAm shell; $pNIPMAm_{50}$: AuNP core with p(NIPAm-*co*-NIPMAm) shell composed of 1:1 ratio of NIPAm/NIPMAm.

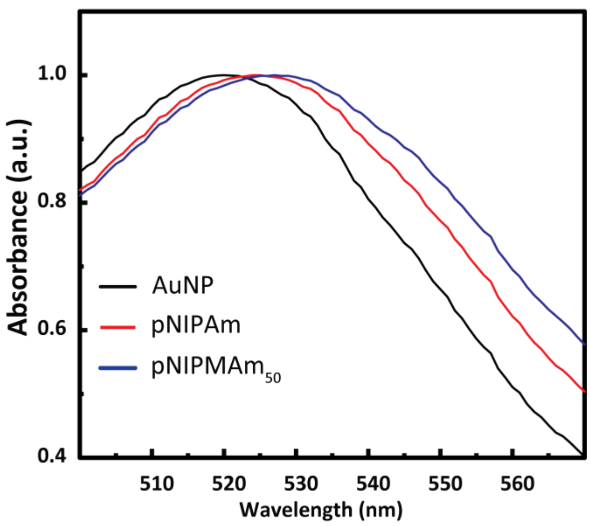

Figure S3: Absorbance spectra of AuNP and core-shell nanoparticles, showing shift in absorbance maxima.

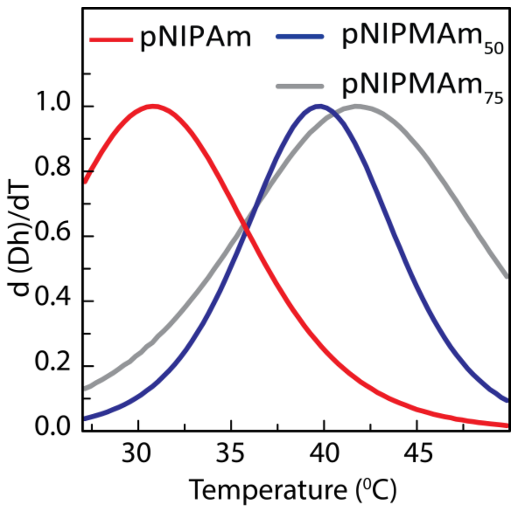

Figure S4: Rate of change of the hydrodynamic diameter of core-shell nanoparticles with respect to temperature.

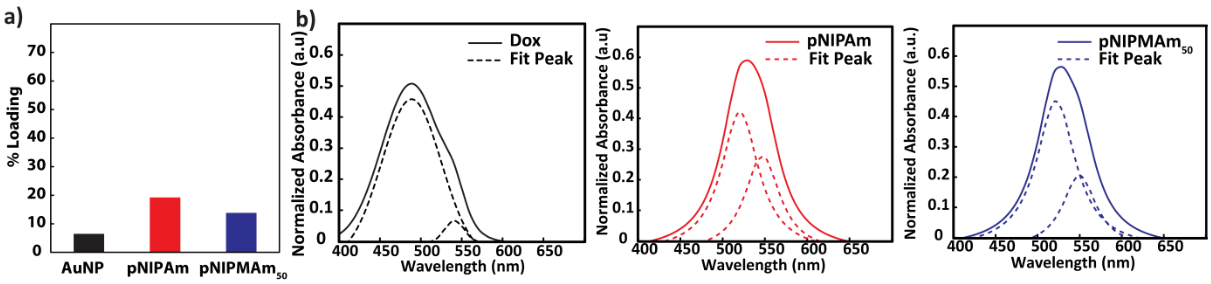

Figure S5: a) Doxorubicin loading efficiency of AuNPs, pNIPMAm and pNIPMAm. b) Absorbance spectra of doxorubicin (Dox) and doxorubicin loaded pNIPAm and pNIPMAm. On deconvolution, the doxorubicin loaded core-shells showed a peak at 520 nm, corresponding to AuNPs and at 540 nm, corresponding to one of the doxorubicin peaks. AuNPs: gold nanoparticles; pNIPAm: AuNP core with pNIPAm shell; $pNIPMAm_{50}$: AuNP core with p(NIPAm-*co*-NIPMAm) shell composed of 1:1 ratio of NIPAm/NIPMAm.

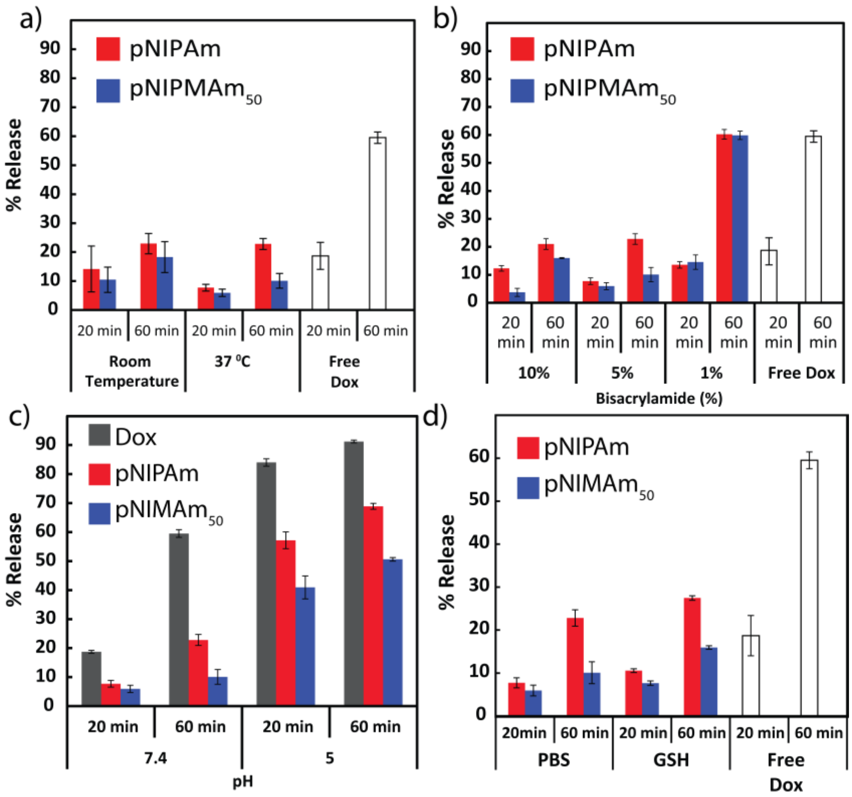

Figure S6: Comparative release of doxorubicin from core-shell nanoparticles a) at room temperature and 37°C, b) different crosslinking density of bisacrylamide at 37°C, c) at pH 5 and pH 7.4 at 37°C and d) in presence of 10 mM glutathione. pNIPAm: AuNP core with pNIPAm shell; pNIPMAm_{50}: AuNP core with p(NIPAm-*co*-NIPMAm) shell composed of 1:1 ratio of NIPAm/NIPMAm.

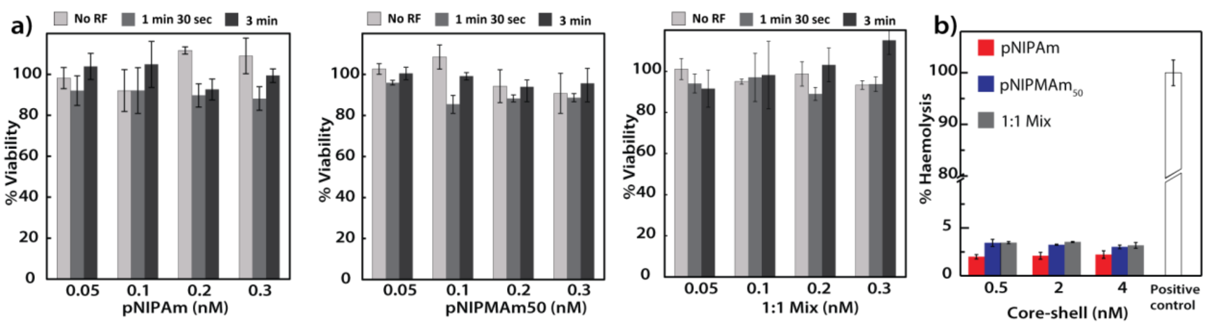

Figure S7: Concentration dependent viability of HeLa cells treated with a) pNIPAm, pNIPMAm_{50} and 1:1 Mix, on exposure to RF and analyzed by MTT assay. b) Haemolysis assay for the core-shell nanoparticles. AuNPs: gold nanoparticles; pNIPAm: AuNP core with pNIPAm shell; pNIPMAm_{50}: AuNP core with p(NIPAm-*co*-NIPMAm) shell composed of 1:1 ratio of NIPAm/NIPMAm, 1:1 Mix: mixture of pNIPAm and pNIPMAm_{50} nanoparticles in 1:1 ratio.

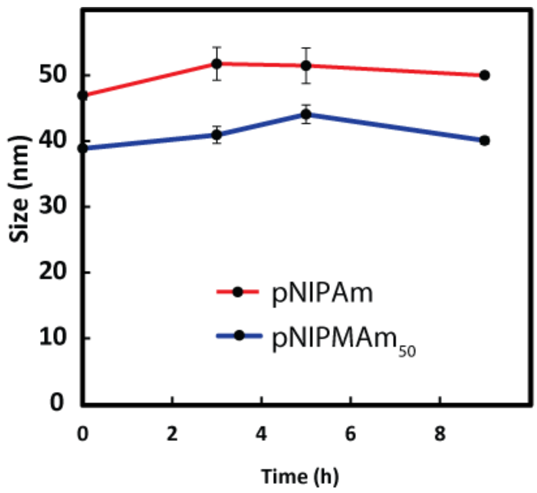

Figure S8: Stability of core-shell in 10% FBS analyzed by monitoring the change in size by dynamic light scattering. pNIPAm: AuNP core with pNIPAm shell; pNIPMAm$_{50}$: AuNP core with p(NIPAm-*co*-NIPMAm) shell composed of 1:1 ratio of NIPAm/NIPMAm.

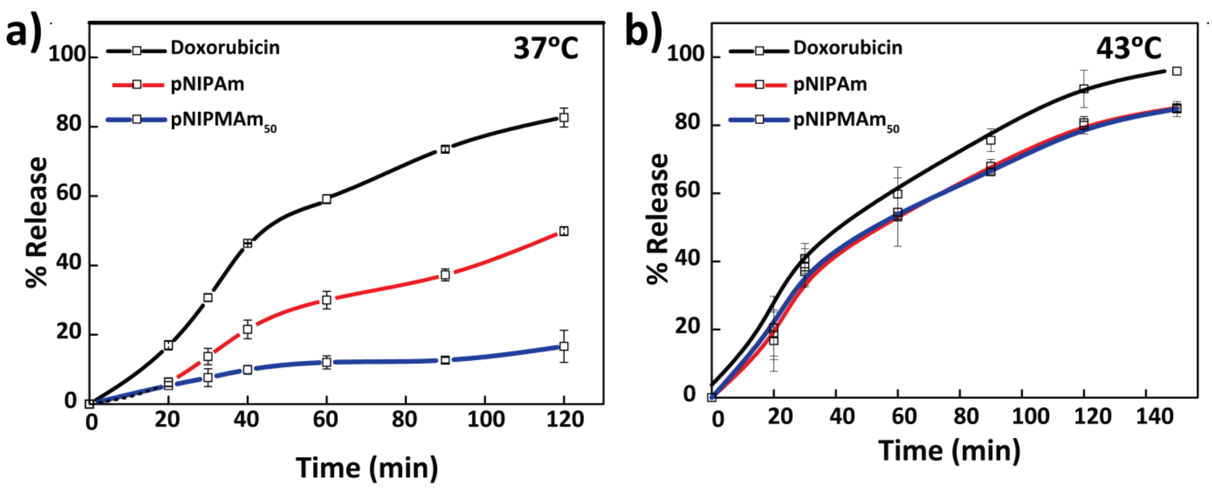

Figure S9: Release profile of doxorubicin from the core-shell nanoparticles. The release was carried out at a) 37°C and b) 43°C. pNIPAm: AuNP core with pNIPAm shell; pNIPMAm$_{50}$: AuNP core with p(NIPAm-*co*-NIPMAm) shell composed of 1:1 ratio of NIPAm/NIPMAm.

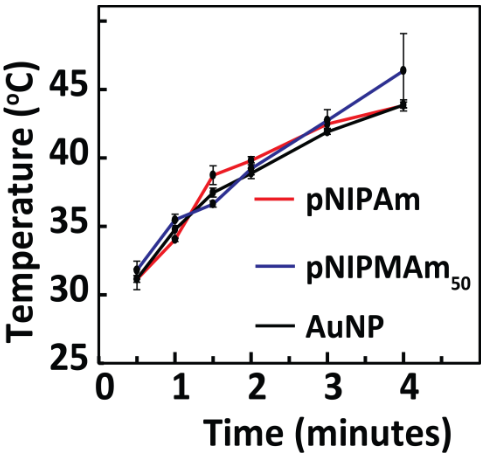

Figure S10: Heating rate of AuNP and core-shell nanoparticles with different shell compositions. AuNP: gold nanoparticles; pNIPAm: AuNP core with pNIPAm shell; $pNIPMAm_{50}$: AuNP core with p(NIPAm-*co*-NIPMAm) shell composed of 1:1 ratio of NIPAm/NIPMAm.