Supplemental Information for

Highly efficient single-stranded DNA functionalization of colloidal II-VI semiconductor nanowires for constructs of multiplex nanoheterostructures

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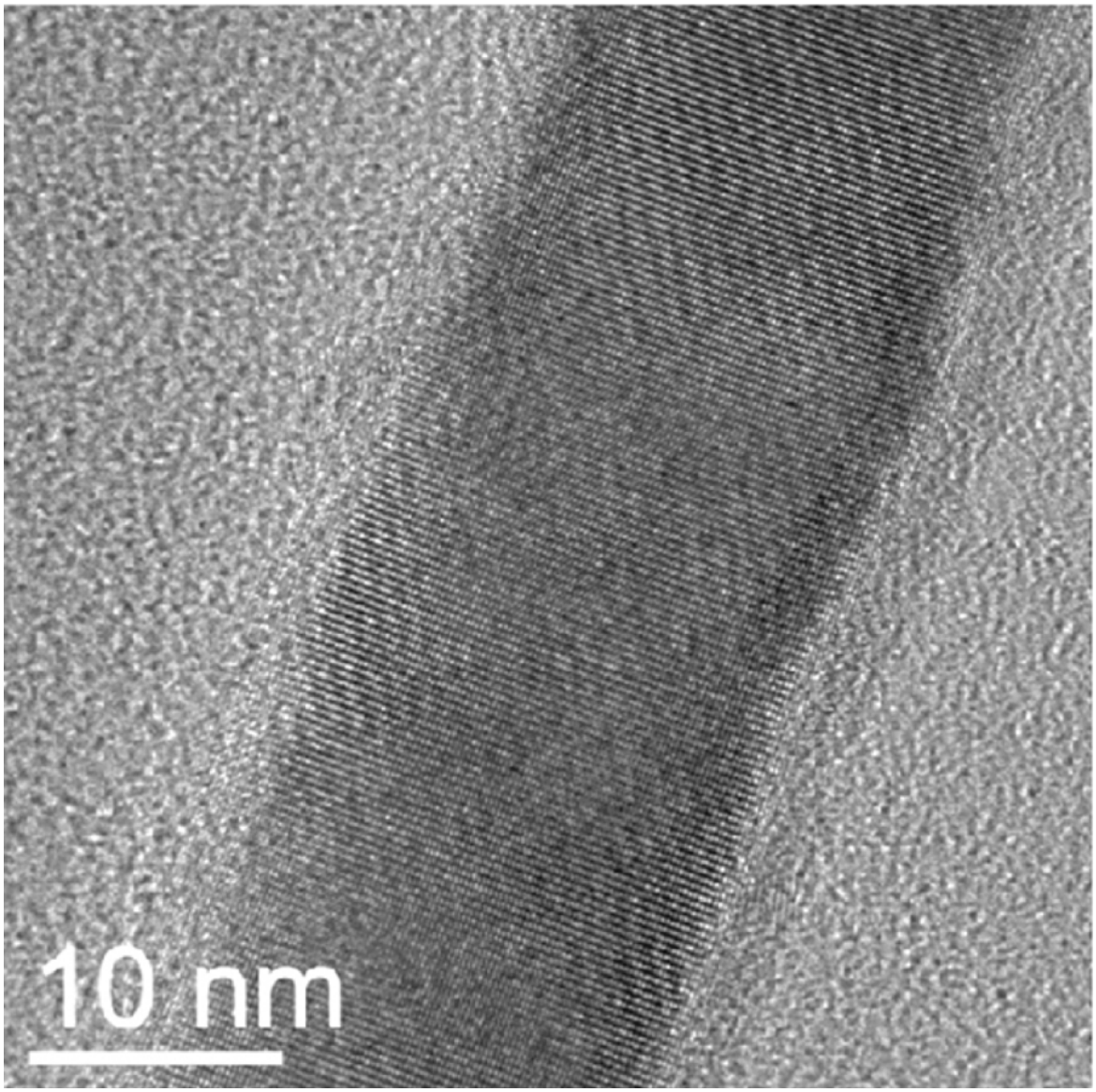

Figure S1. Additional HRTEM image of the as-synthesized organic ligand capped ZnTe nanowires.

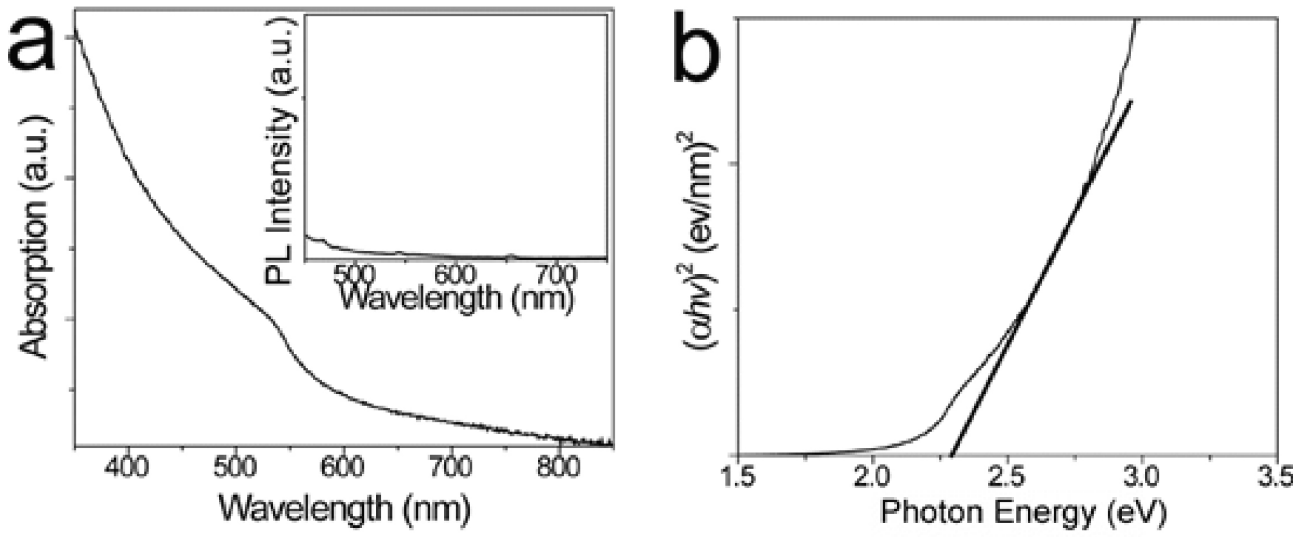

Figure S2. (a) UV-vis absorption and PL (inset) spectra of the as synthesized initial organic capped ZnTe nanowires. (b) Plots of $(ahv)^2$ versus photon energy (hv) of the initial ZnTe nanowires. The UV-vis absorption spectrum was recorded from powder samples drop-cast at room temperature on a glass slide using a UV–vis–NIR spectrometer equipped with an integrating sphere.

Figure S3. Additional TEM images of the ZnTe/ZnS core/shell nanowires functionalized with DNA.

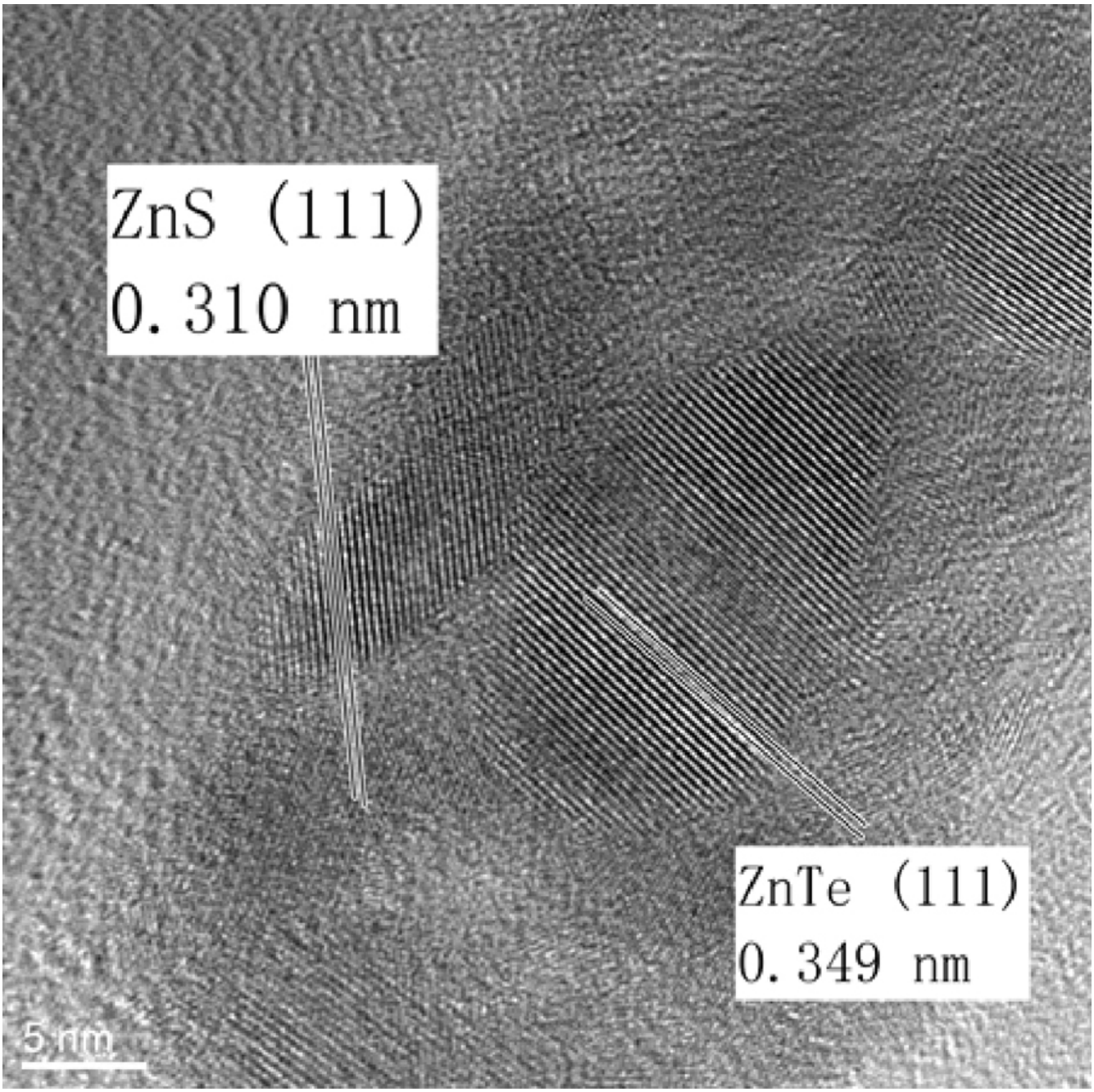

Figure S4. HRTEM images of the ZnTe/ZnS core/shell nanowires functionalized with DNA. The crystalline lattice parameters of the ZnTe core and ZnS shell are marked. The ZnS shell does not appear to encapsulate the surface of the ZnTe NW evenly, but seems to instead be deposited in clusters resulting in a rough surface. This can be explained by the large mismatch of the crystal lattice parameters between ZnTe and ZnS (12.6%), which makes defect-less layer-by-layer growth very challenging.

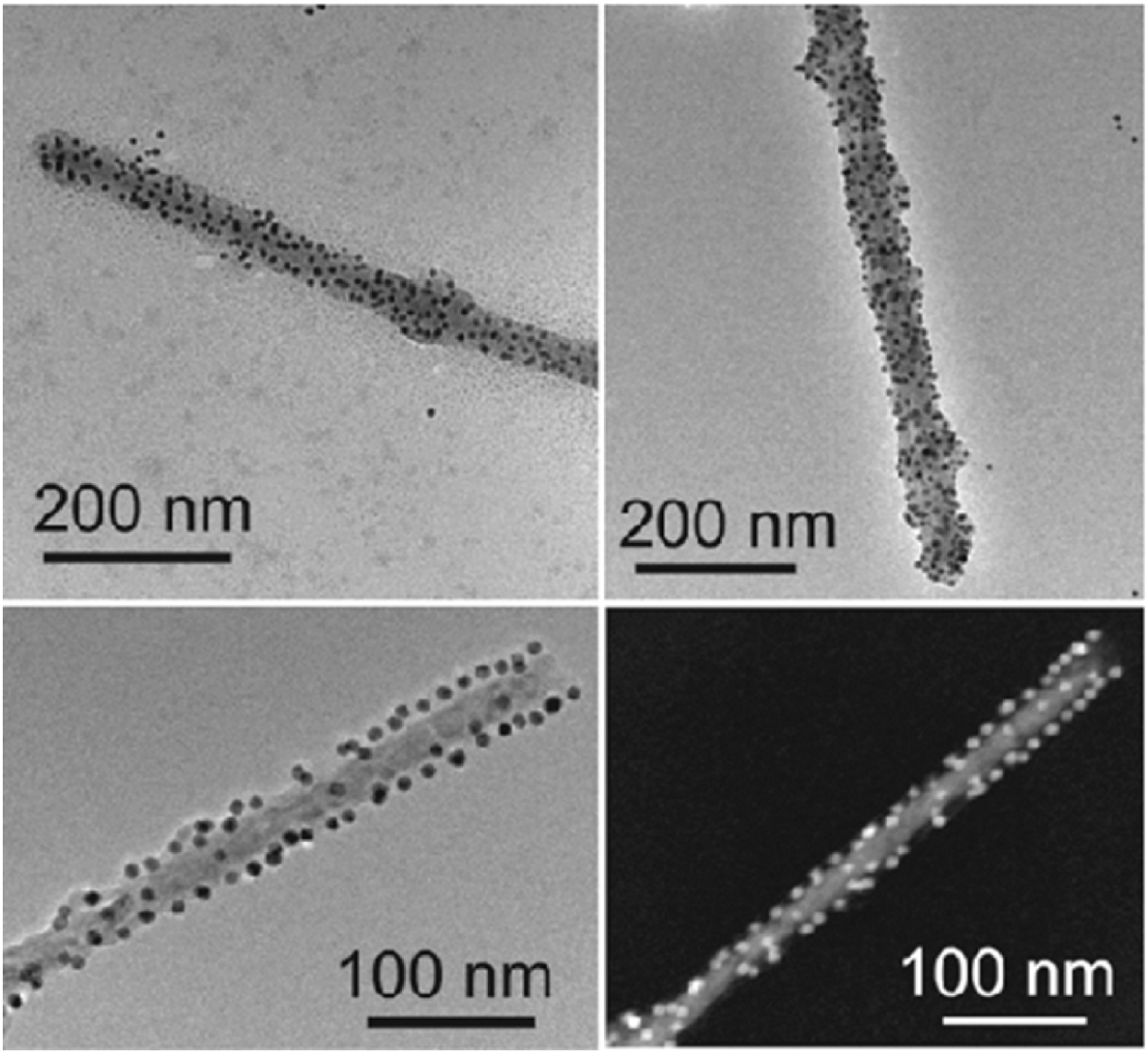

Figure S5. TEM and STEM images of the 1D-0D ZnTe/ZnS-Au NW-NP NHSs.

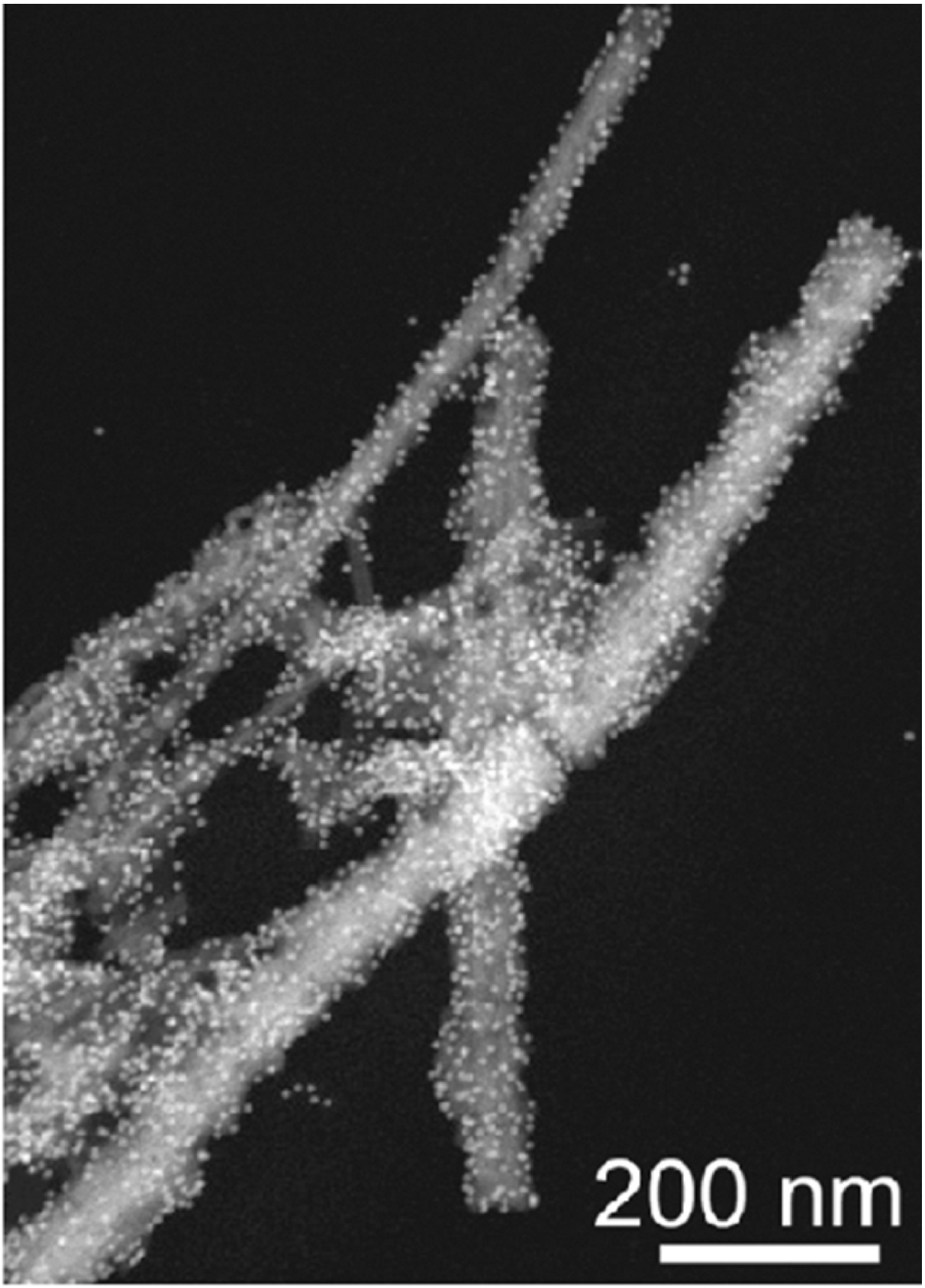

Figure S6. Enlarged STEM image of the 1D-0D ZnTe/ZnS-Au NW-NP NHSs.

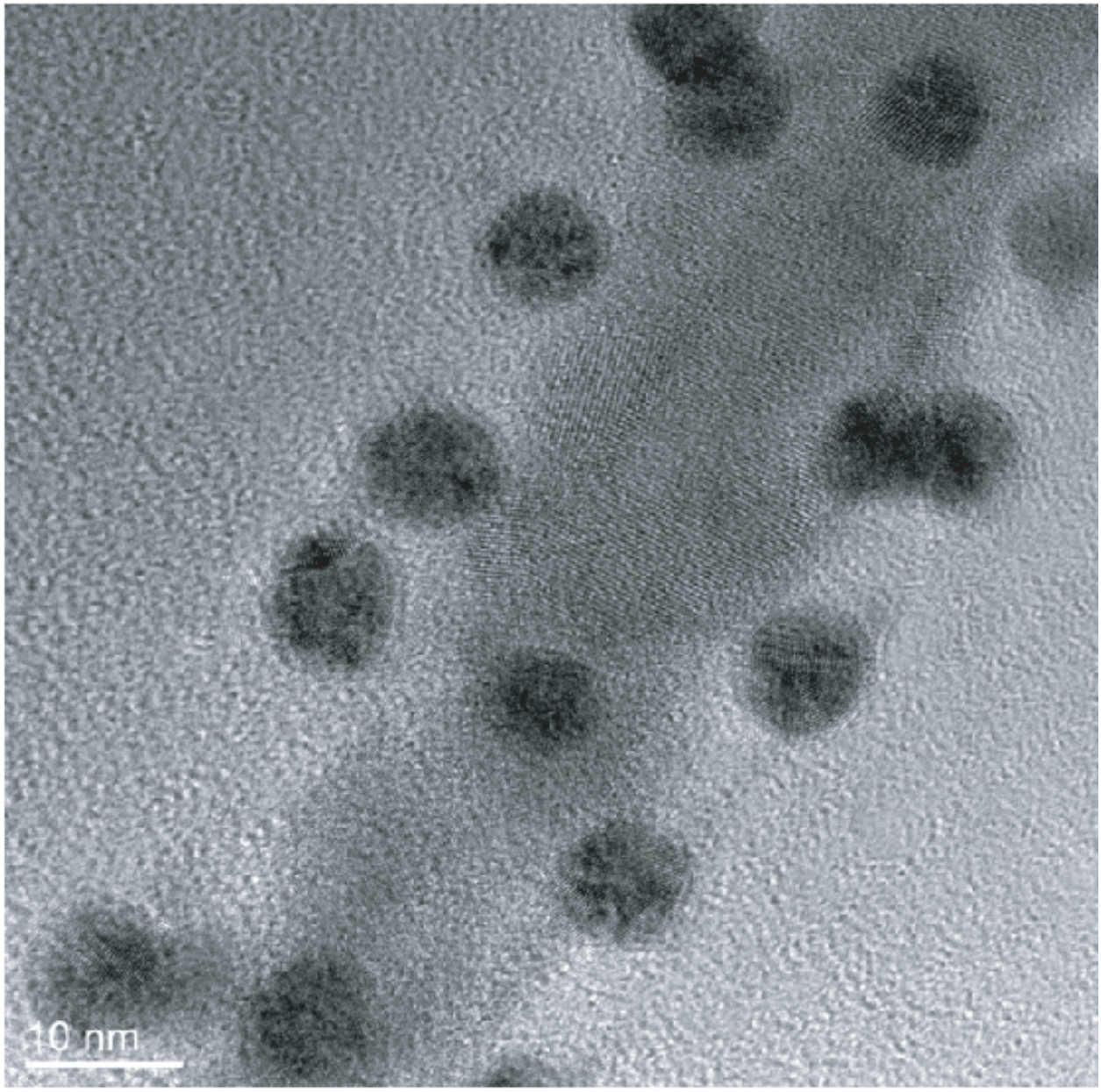

Figure S7. Enlarged HRTEM image of a single 1D-0D ZnTe/ZnS-Au NW-NP NHS.

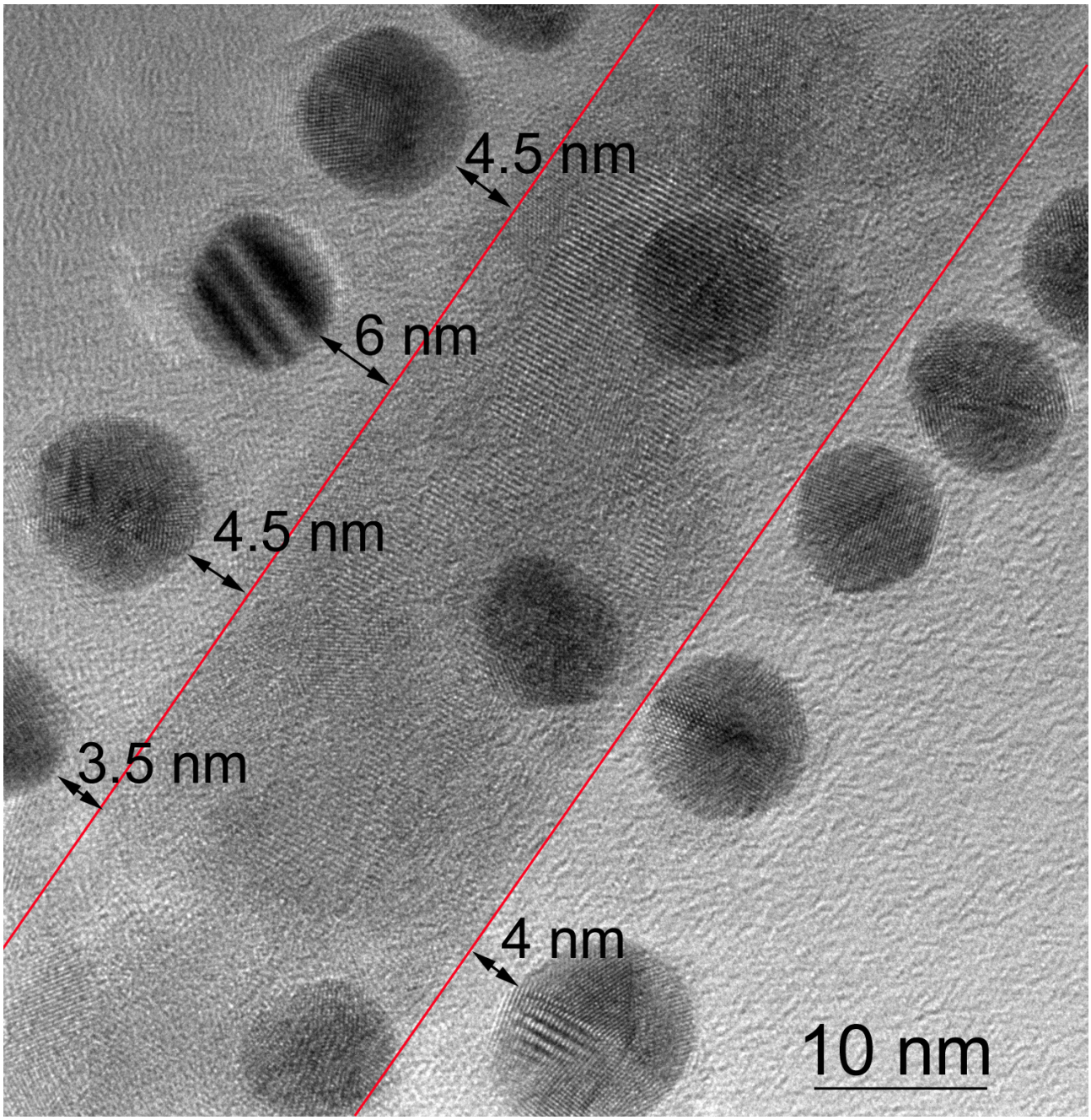

Figure S8. Enlarged HRTEM image of another single 1D-0D ZnTe/ZnS-Au NW-NP NHS.

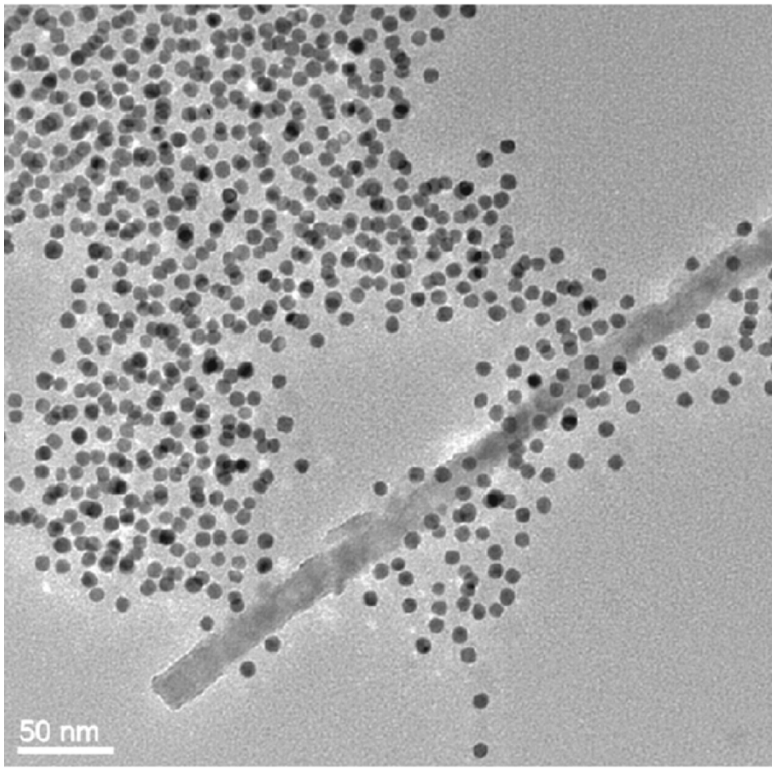

Figure S9. TEM image of the control experiment in which ZnTe/ZnS nanowires were functionalized with the following DNA sequence: 5'- G*G*G* G*G*T TTA GGA GGA TAG TTC GGT GGC TGT TCA GGG TCT CCT CCT -3', not complementary to the DNA sequence displayed from the AuNPs (T28-SH).

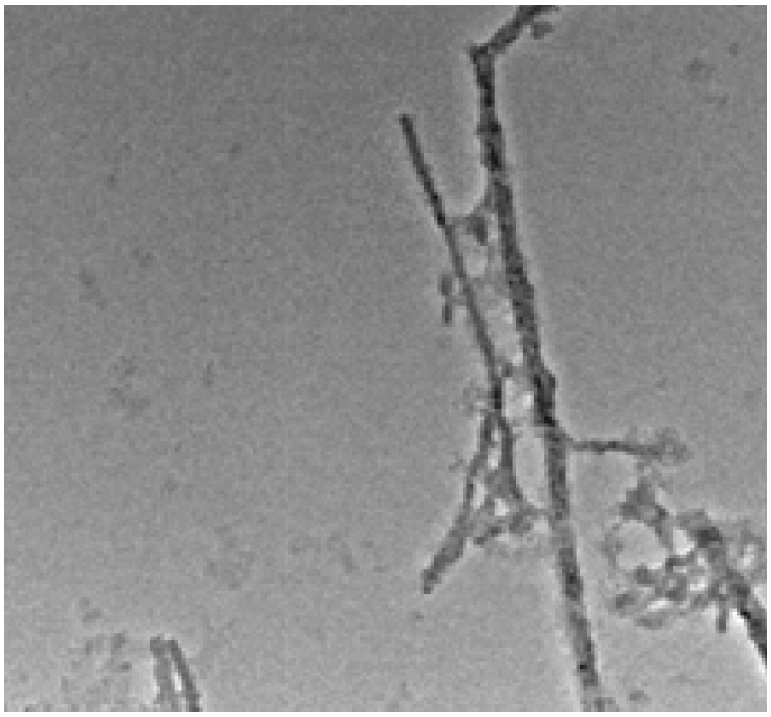

Figure S10. Additional TEM image of the 1D-0D ZnTe/ZnS-CdTe/CdS NW-QD NHSs.

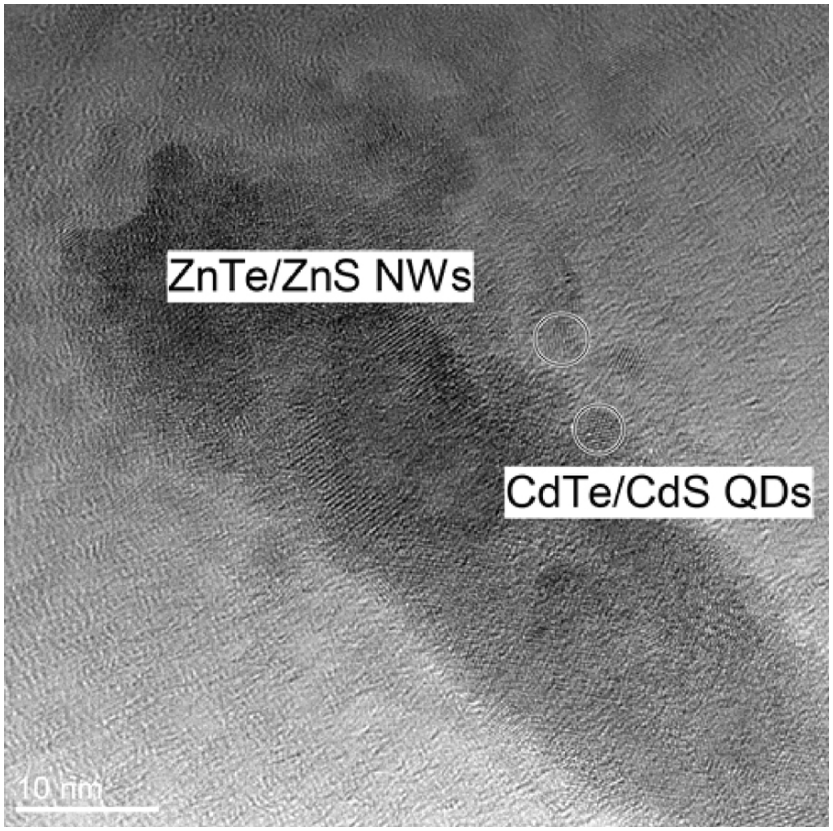

Figure S11. HRTEM image of a single 1D-0D ZnTe/ZnS-CdTe/CdS NW-QD NHS.

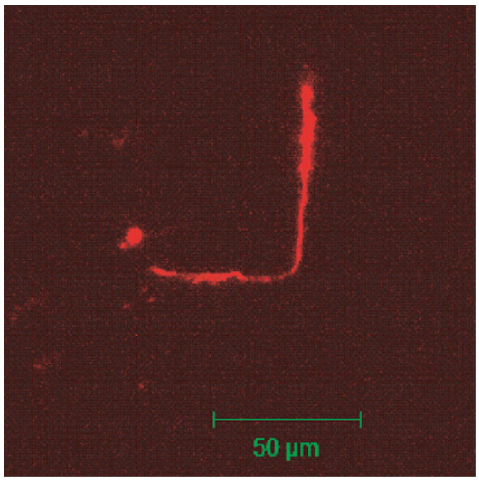

Figure S12. Additional false color confocal fluorescence (excited using 405 nm laser, 560 nm long pass filter) images of the 1D-0D ZnTe/ZnS-CdTe/CdS NW-QD NHSs.

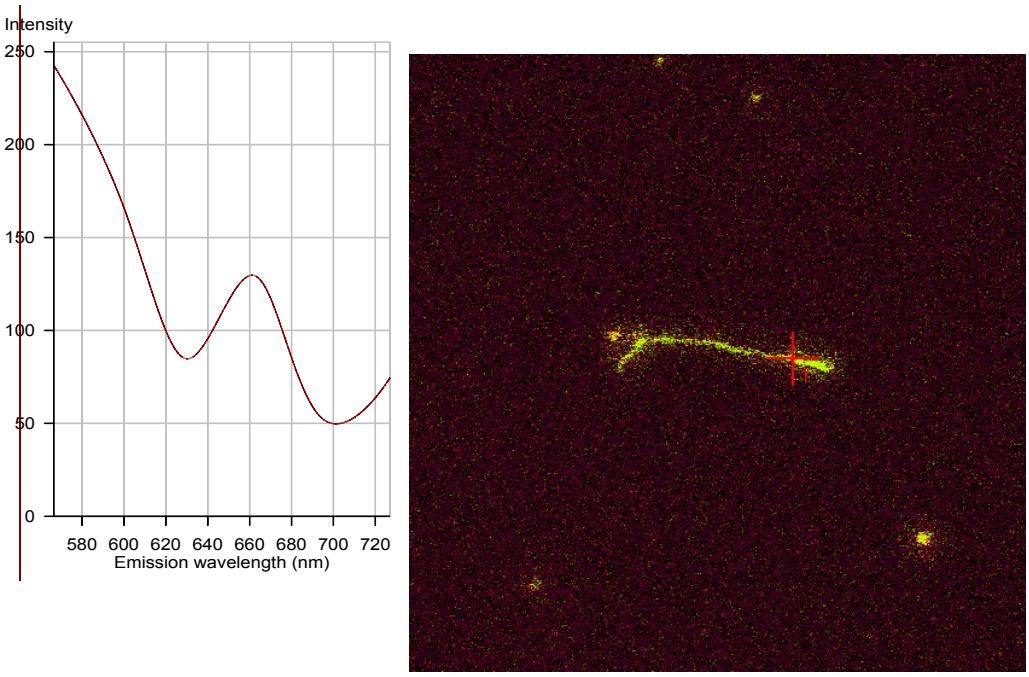

Figure S13. False color confocal fluorescence (excited using 405 nm laser) image of a single 1D-0D ZnTe/ZnS-CdTe/CdS NW-QD NHS. On the left is the emission spectrum using the Lamda scanning mode.

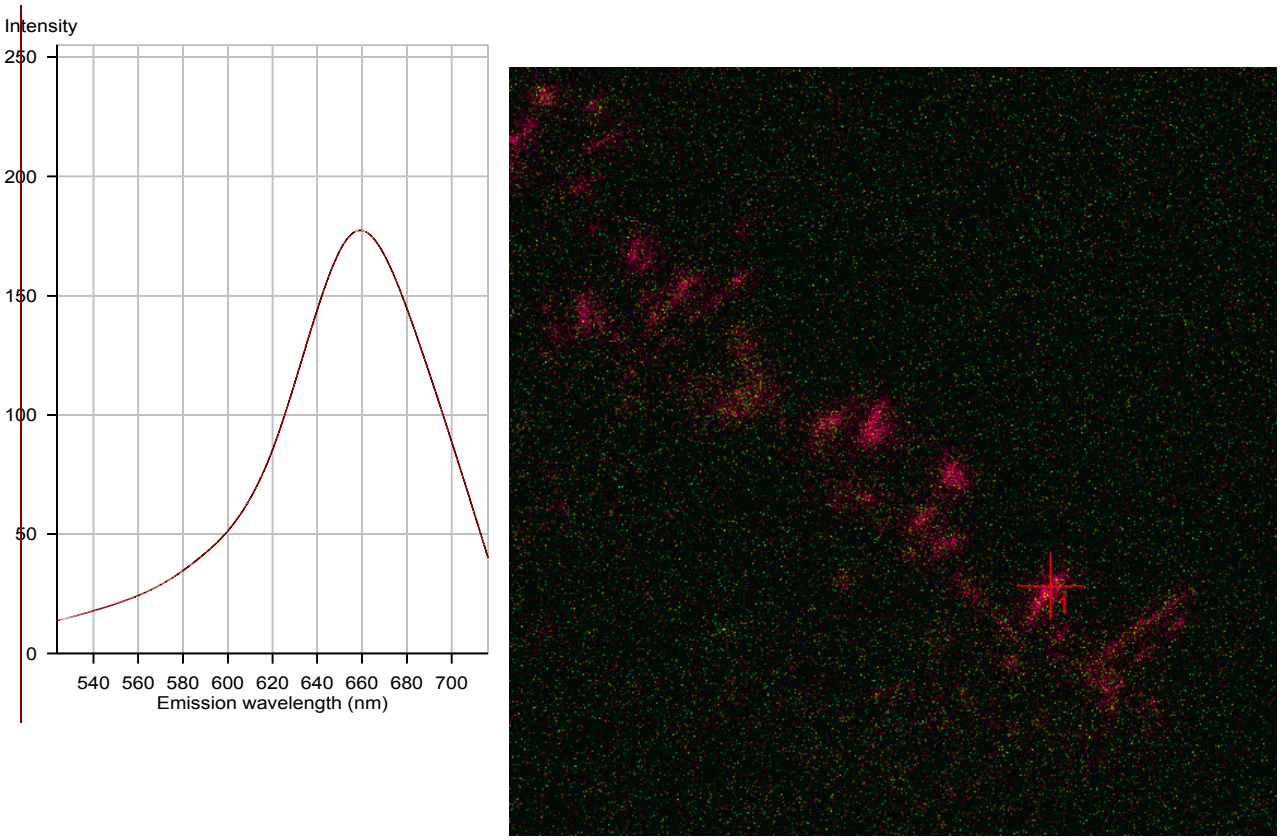

Figure S14. Additional false color confocal fluorescence (excitated using 405 nm laser) images of a single 1D-0D ZnTe/ZnS-CdTe/CdS NW-QD NHS. On the left is the emission spectrum using the Lamda scanning mode.

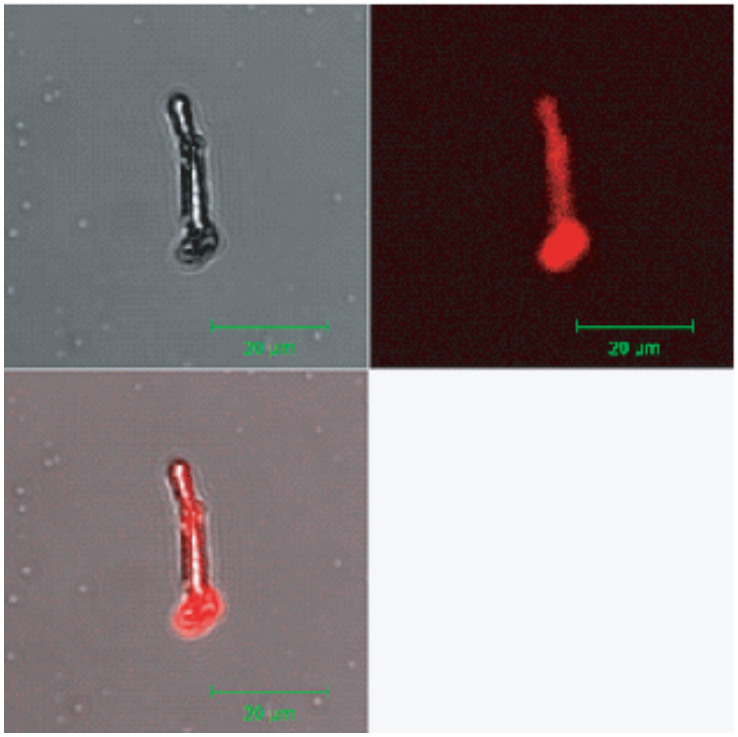

Figure S15. Additional transmitted light (HeNe633 nm) and false color confocal fluorescence (laser 405 nm, 560 nm long pass filter) images of a single 1D-0D ZnTe/ZnS-CdTe/CdS NW-QD NHS.

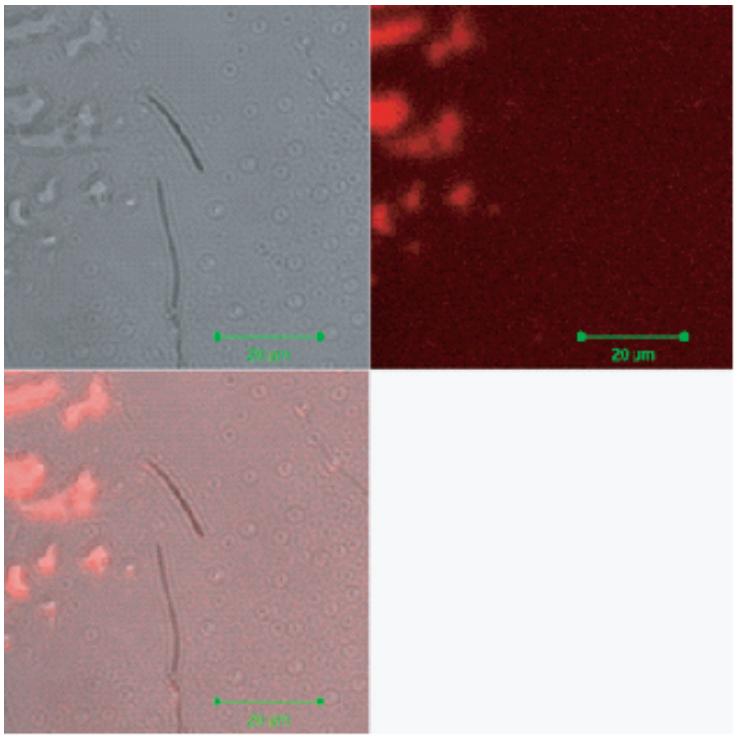

Figure S16. Transmitted light and false color confocal fluorescence images of a control sample in which ZnTe/ZnS nanowires were functionalized with 5'- AAA AAA AAA AAA AAA AAA AAA AAA AAA AG*G* G*G*G* G -3', while the CdTe/CdS quantum dots were functionalized with the following random sequence: 5'- G*G*G* G*G*T TTA GGA GGA TAG TTC GGT GGC TGT TCA GGG TCT CCT CCT -3'.