Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

One-pot aqueous synthesis of highly strained CdTe/CdS/ZnS nanocrystals and their interactions with cells

Mehriban Ulusoy,[a] Johanna-Gabriela Walter,[a] Antonina Lavrentieva,[a] Imme Kretschmer,[a] Lydia Sandiford,[b] Alix Le Marois,[b] Rebecca Bongartz,[a] Pooyan Aliuos,[c] Klaus Suhling,[b] Frank Stahl,[a] Mark Green,[b*] Thomas Scheper[a*]

[a] Gottfried Wilhelm Leibniz University of Hannover, Institute of Technical Chemistry, 30167 Hanover, Germany. E-mail: scheper@iftc.uni-hannover.de

[b] King's College London, Department of Physics, The Strand, WC2R 2LS London, UK. E-mail: mark.a.green@kcl.ac.uk

[c] Hannover Medical School, Biomaterial Engineering, 30625 Hannover, Germany

Supporting Figures

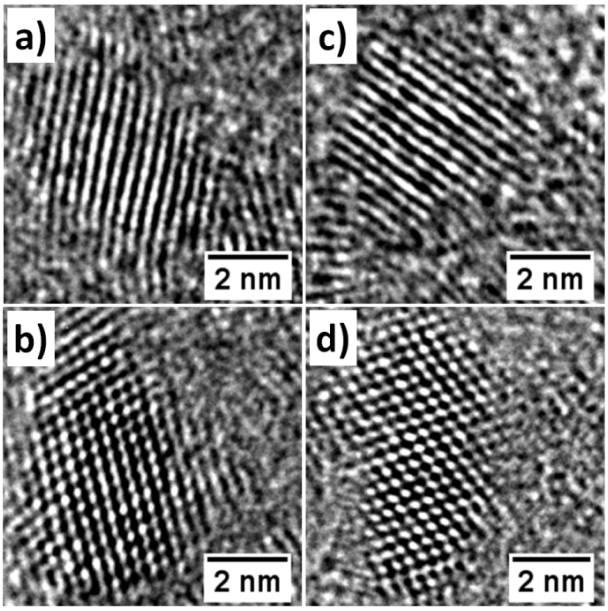

Figure S1. HRTEM images of CdTe/CdS/ZnS NCs with high magnifications showing different tetrahedral shapes.

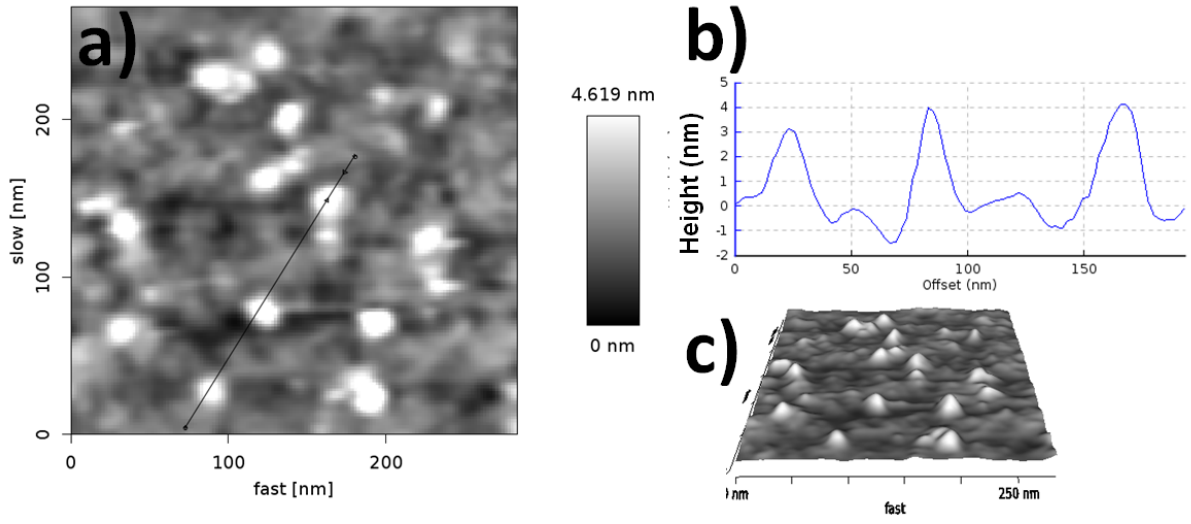

Figure S2. Atomic force microscopy (AFM) images of CdTe/CdS/ZnS nanocrystals deposited on poly-lysine coated glass slides (a), the height profile of the cross-section marked with black straight line (b), 3-D surface plot of AFM image in (c).

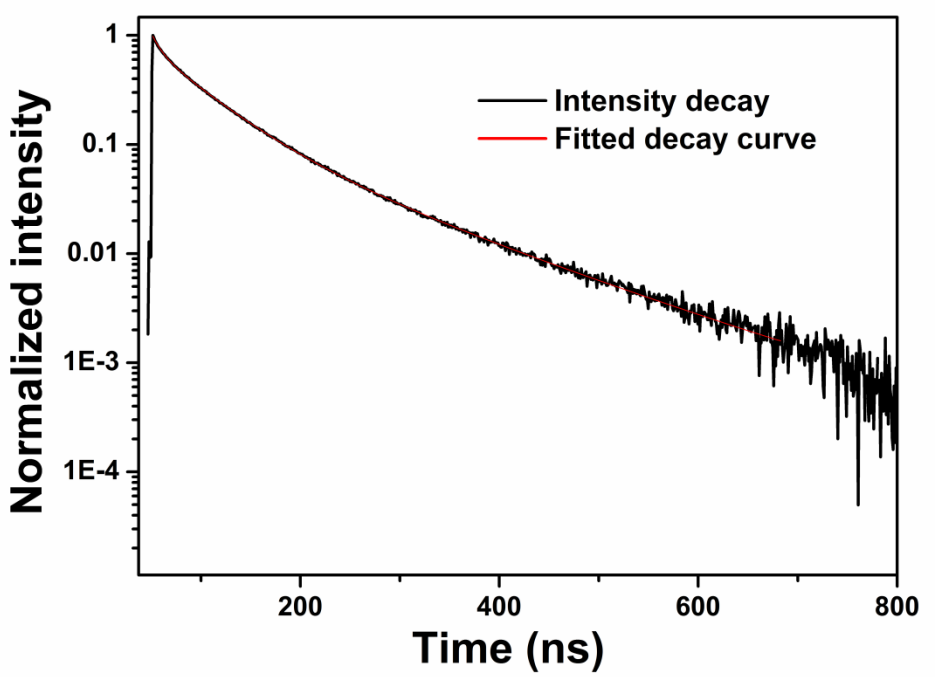

Figure S3. Fluorescence lifetime decay profile of CdTe/CdS/ZnS NCs ($\lambda_{emission}$=683 nm). Sample was excited at 467 nm with a repetition rate of 1MHz. Sample was scanned for 30 seconds to constitute a single decay. This operation was repeated 5 times. An average decay was computed from all repeats for subsequent fitting (red line).

Table S1. Fluorescence lifetime characteristics of CdTe/CdS/ZnS NCs ($\lambda_{emission}$=683 nm)

A1 (%)	τ_1 (ns)	A2 (%)	τ_2 (ns)	A3 (%)	τ_3 (ns)	τ_{av} (ns) *
25.2 ± 0.6	9.0 ± 0.3	57.6 ± 0.5	50.7 ± 0.8	15.1 ± 0.8	134 ± 3	51.7

*Fit parameter derived using the tri-exponential fitting function:

$$I(t) = y_0 + A_1 e^{-\frac{t}{\tau_1}} + A_2 e^{-\frac{t}{\tau_2}} + A_3 e^{-\frac{t}{\tau_3}}$$

Where τ_1, τ_2 and τ_3 are the decay constants and A_1, A_2, A_3 their relative amplitudes, y_0 is the offset and approaches zero in appropriately background-corrected data. The intensity-weighted average lifetime was calculated according to:

$$\tau_{av} = (A_1\tau_1^2 + A_2\tau_2^2 + A_3\tau_3^2)/(A_1\tau_1 + A_2\tau_2 + A_3\tau_3)$$

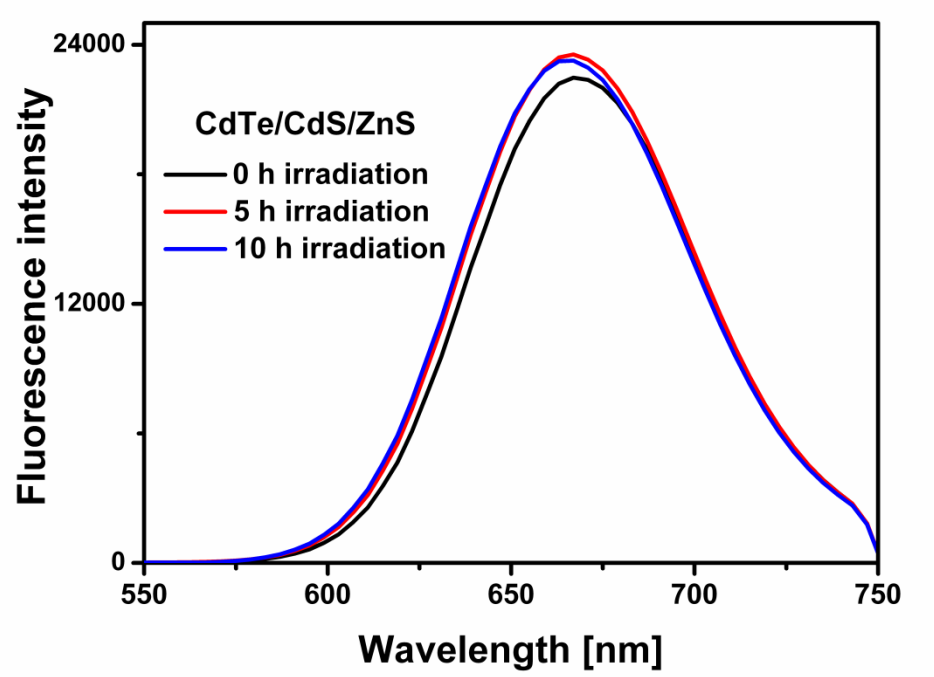

Figure S4. Fluorescence emission spectra of CdTe/CdS/ZnS NCs before and after irradiation under UV light at 360 nm for 5 h and 10 h. Fluorescence intensity was recorded every 10 s.

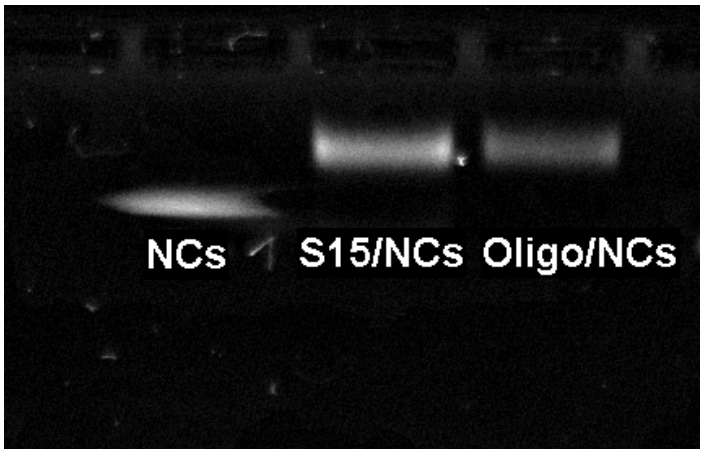

Figure S5. Digital image of agarose gel electrophoresis for CdTe/CdS/ZnS NCs, S15 aptamer conjugated NCs (S15/NCs) and oligonucleotide conjugated NCs (oligo/NCs) (exposure time: 0.4 s)