Electronic Supplementary Information (ESI)

Size Dependent CdSe Quantum Dot-Lysozyme Interaction and Effect on Enzymatic Activity

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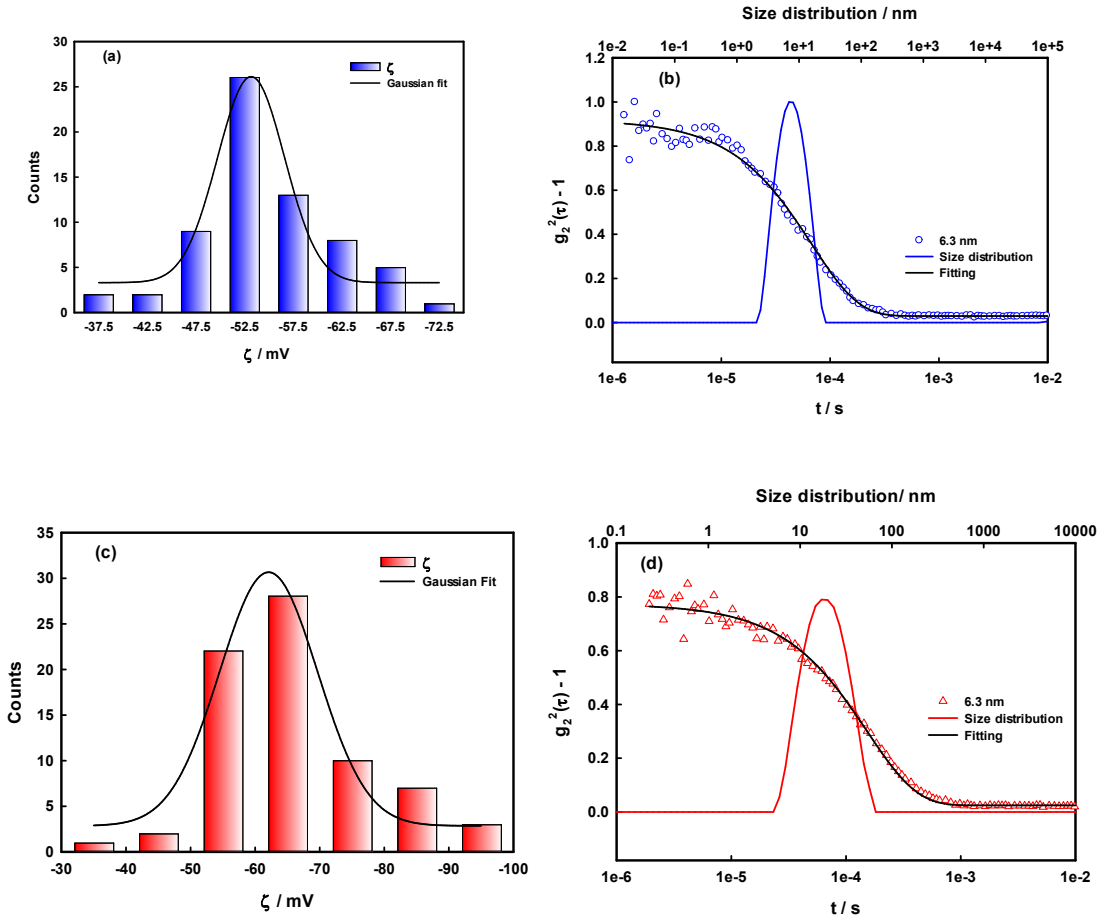


Figure S1: (a and c) Zeta potential and (b and d) Time autocorrelation function, size distribution hydrodynamic radius (R_h) of 2.5 and 6.3 nm sized CdSe QDs.

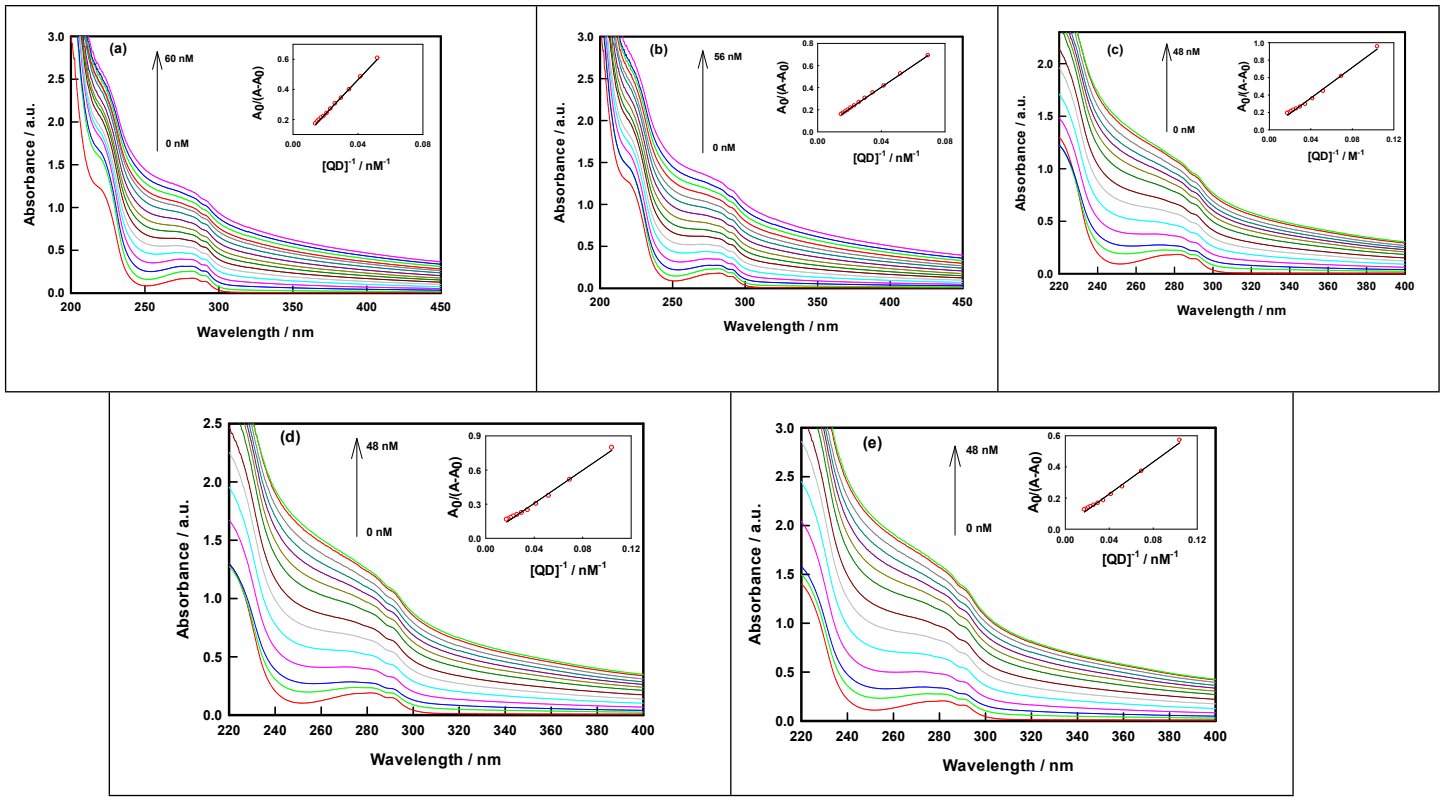
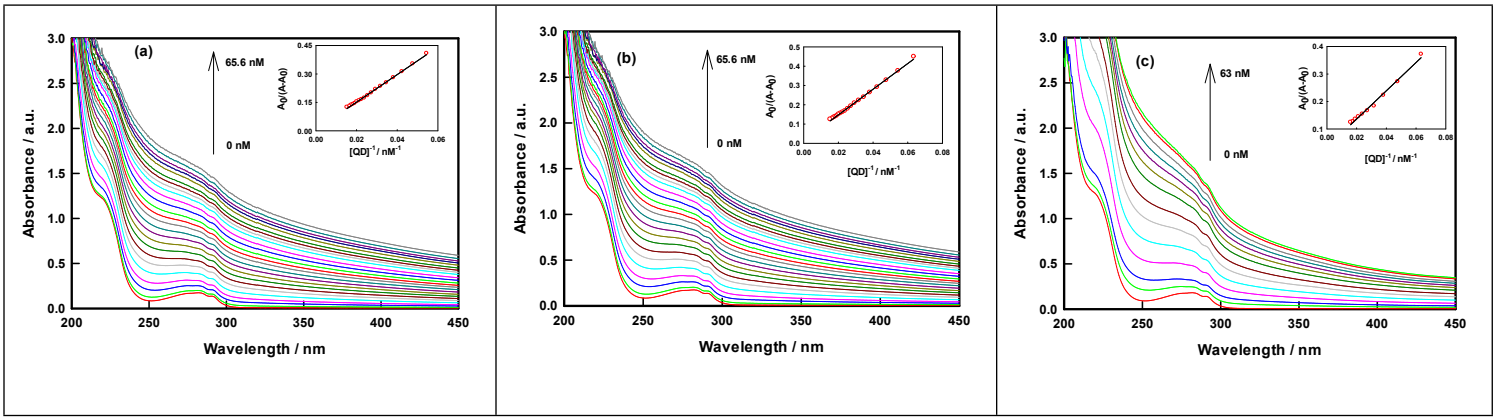


Figure S2: Absorption spectra of lysozyme (5 μM) in the absence and presence of 2.5 nm sized QD (2.6 nM to 52.5 nM) at (a) 298, (b) 303, (c) 308, (d) 313 and (e) 318 K.



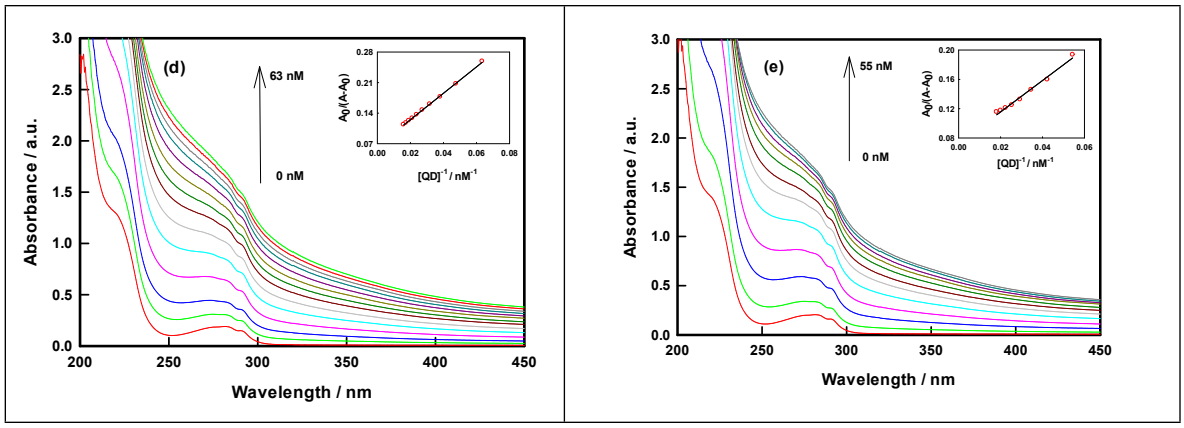


Figure S3: Absorption spectra of lysozyme (5 µM) in the absence and presence of 6.3 nm sized QD (2.6 nM to 52.5 nM) at (a) 298, (b) 303, (c) 308, (d) 313 and (e) 318 K.

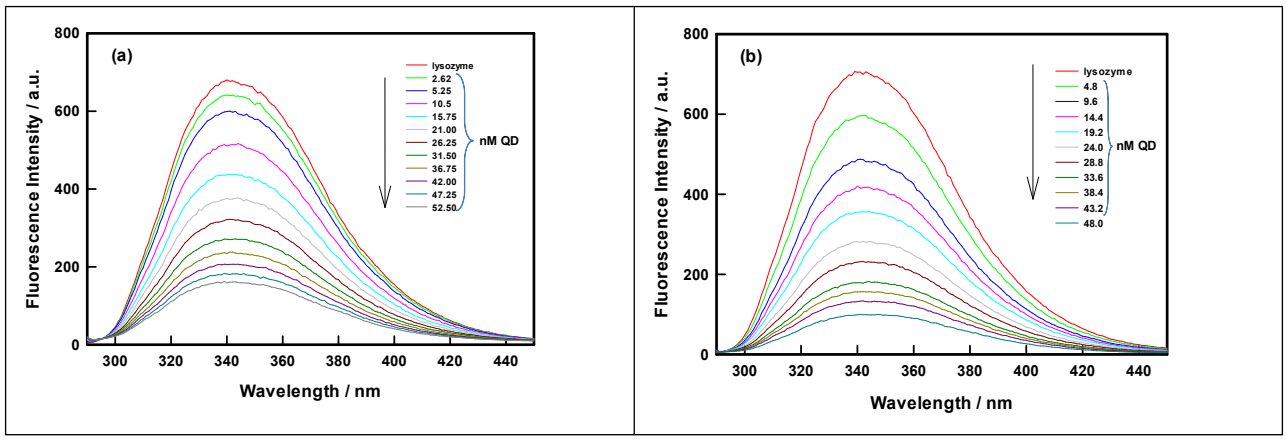


Figure S4: Fluorescence quenching spectra of lysozyme (5 µM) in the absence and presence of (a) 2.5 nm, (b) 6.3 nm sized QD (2.6 nM to 52.5 nM) at 298 K.

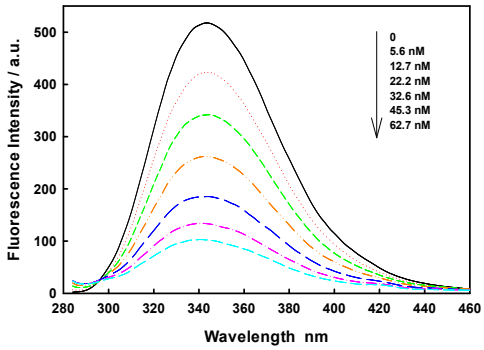
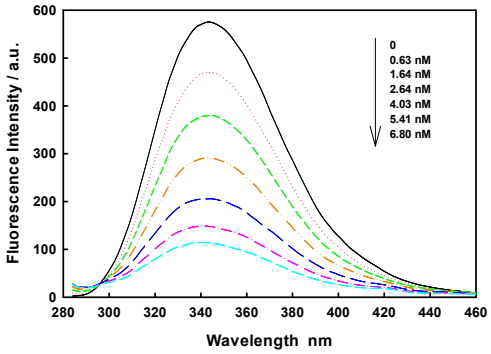
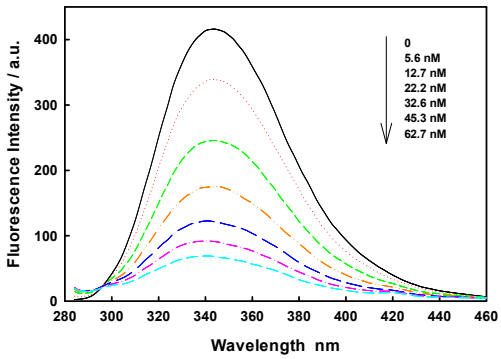
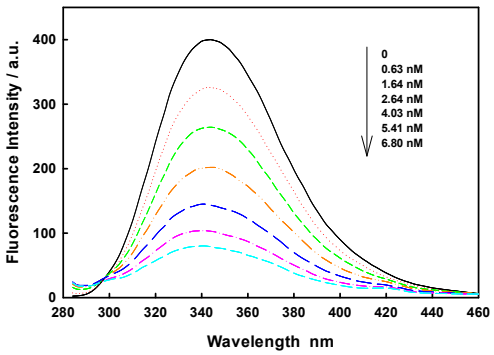
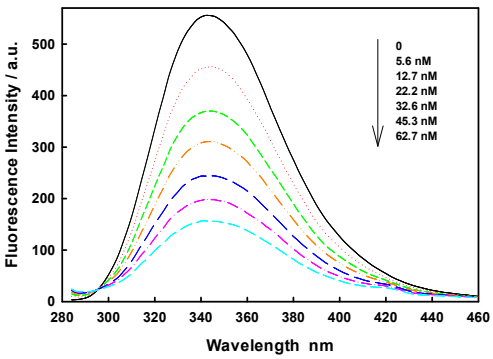
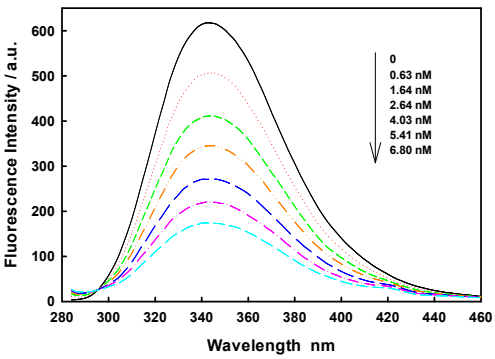
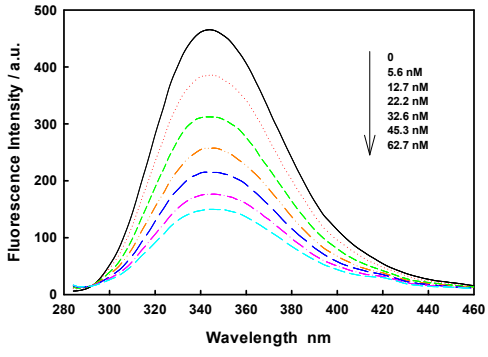
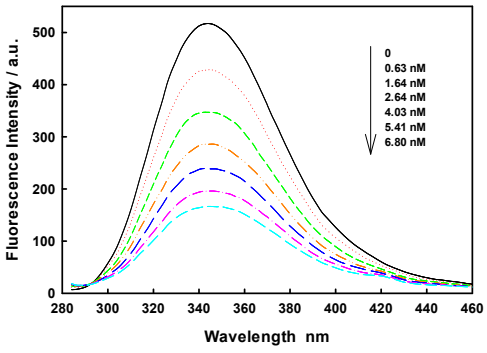
	2.5 nm QD	6.3 nm QD
0 M NaCl		
0.001 M NaCl		
0.01 M NaCl		
0.05 M NaCl		

Figure S5: Fluorescence quenching spectra of lysozyme (5 µM) in the absence and presence of (a) 2.5 nm, (b) 6.3 nm sized QD (2.6 nM to 52.5 nM) at different concentration of NaCl recorded at 298 K.

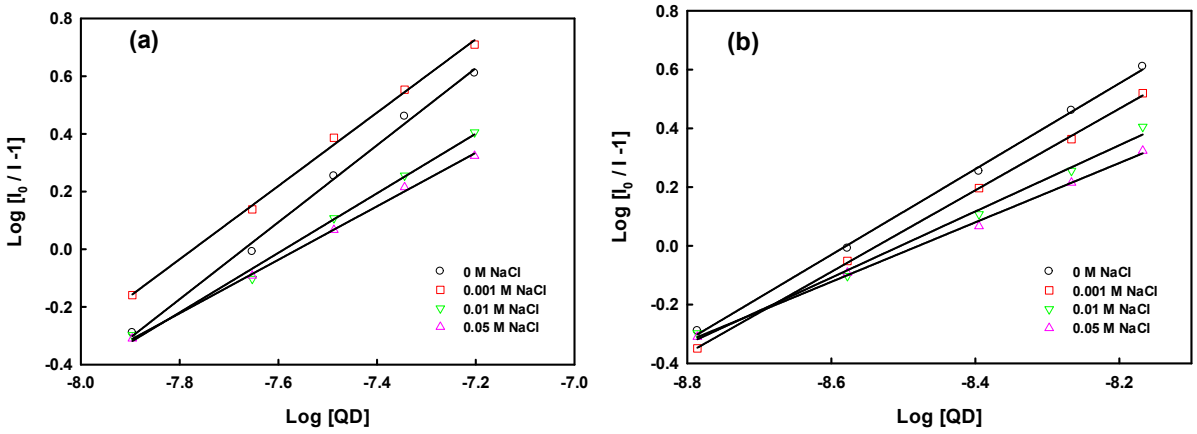


Figure S6: Logarithmic plot (Stern–Volmer plots) derived from fluorescence data of lysozyme (5 µM) as function of concentration of (a) 2.5 and (b) 6.3 nm sized QD at different salt concentration.

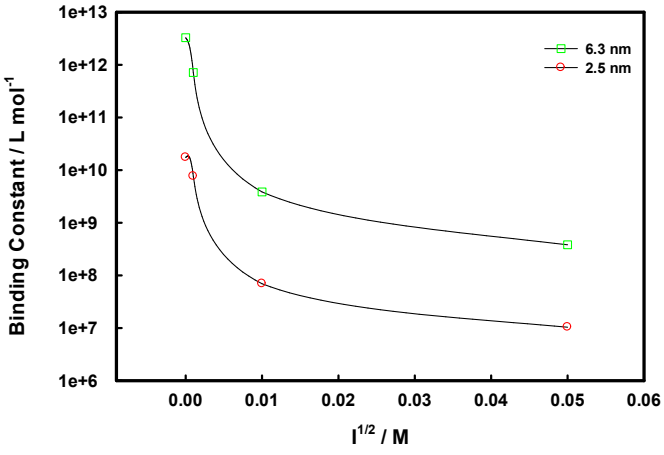


Figure S7: Semi-Log plot of binding constant derived from Stern–Volmer plots as function of concentration of NaCl of 2.5 and 6.3 nm sized QD with lysozyme (5 µM).

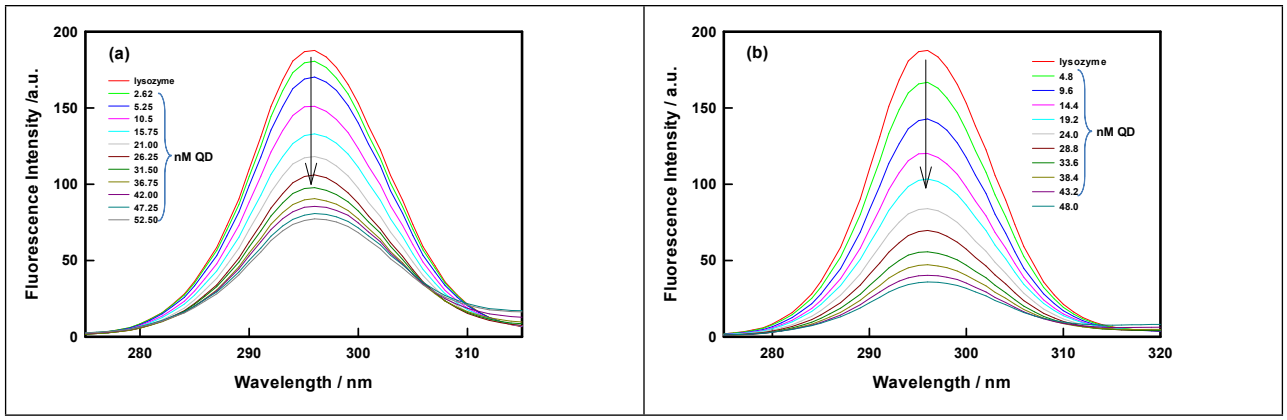


Figure S8: The synchronous fluorescence spectra at Δλ=15 nm (Tyrosine) of Lysozyme (5 μM), in the absence and presence of (a) 2.5 nm, (b) 6.3 nm sized QD (2.6 nM to 52.5 nM).

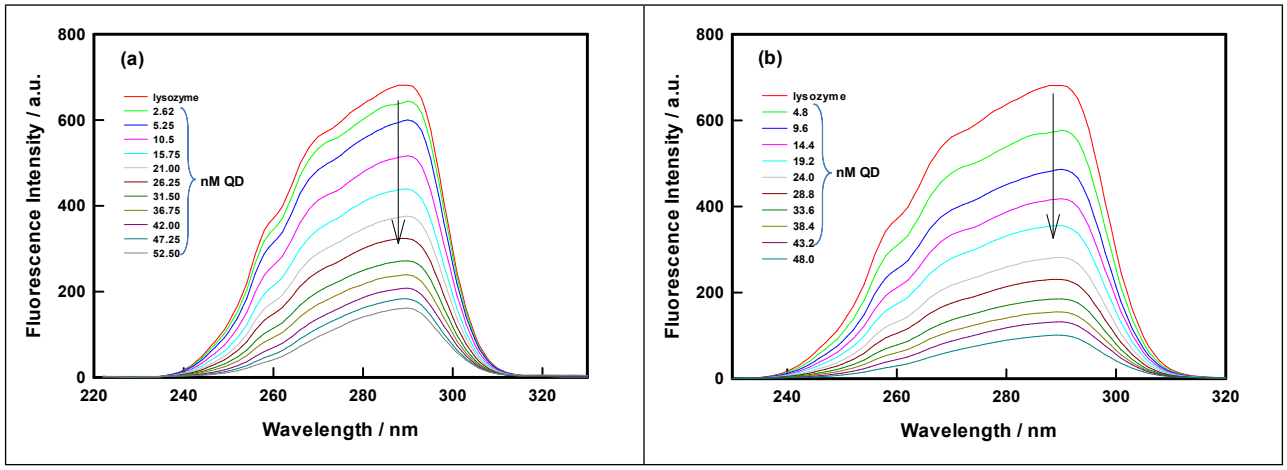


Figure S9: The synchronous fluorescence spectra at Δλ=60 nm (Tryptophan) of Lysozyme (5 μM), in the absence and presence of (a) 2.5 nm, (b) 6.3 nm sized QD (2.6 nM to 52.5 nM).

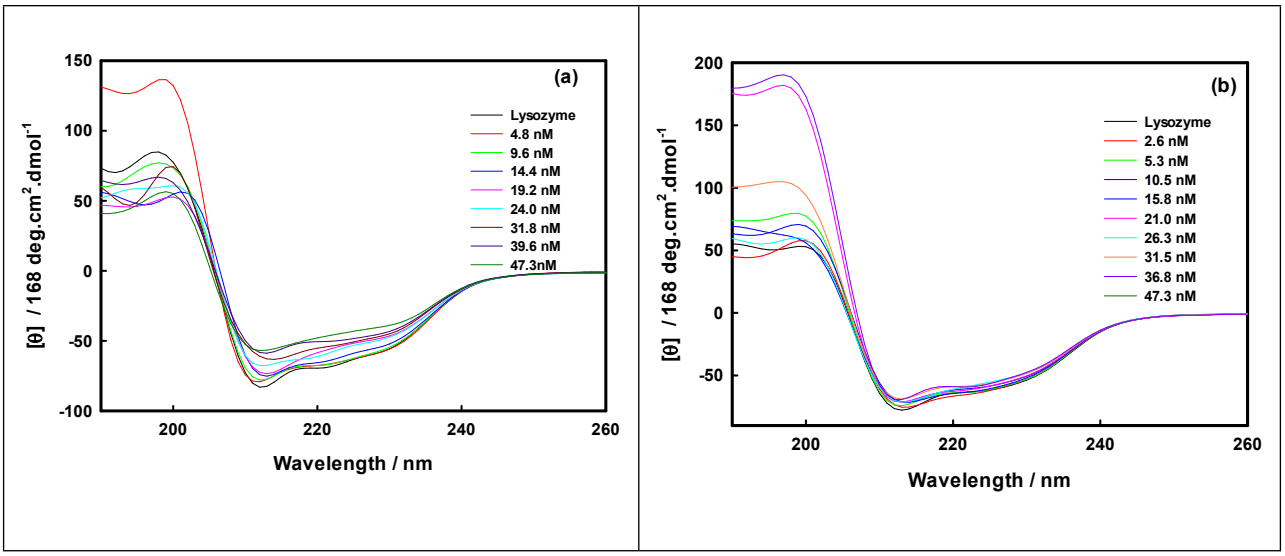


Figure S10: The CD spectra of Lysozyme (5 μM), in the absence and presence of (a) 2.5 nm, (b) 6.3 nm sized QD (2.6 nM to 52.5 nM).

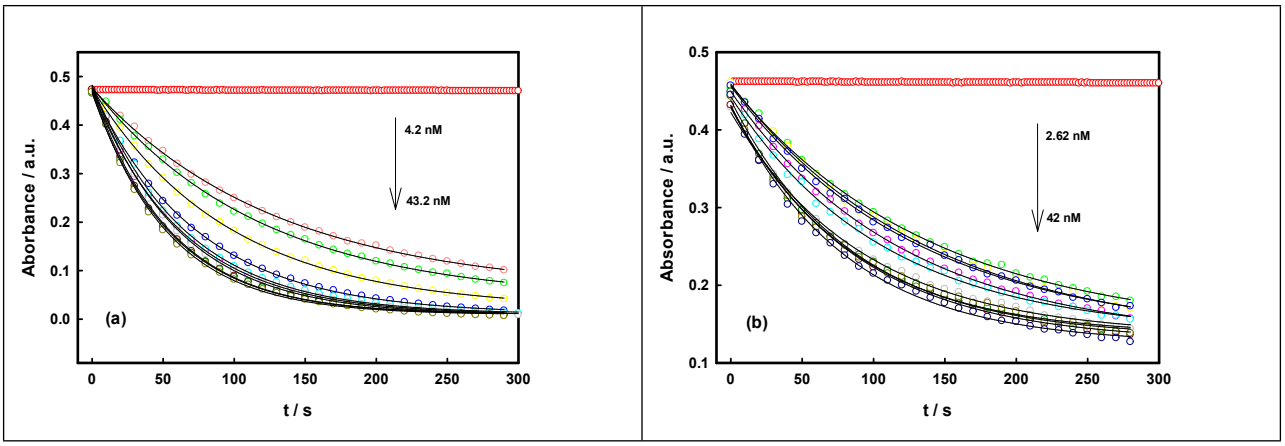


Figure S11: Enhancement in the enzymatic activity of lysozyme (5 μM) by (a) 2.5 nm, (b) 6.3 nm sized QD. Different amount of QD (2.6 nM to 52.5 nM) is used as indicated by the colored lines.

Table S1: Physical characteristics of the samples used in this study measured at room temperature 20 ^{0}C.

QD size	DLS size/nm	TEM size/nm	UV-vis size/nm	Zeta potential/mV
2.5nm	3.8±0.2	2.5±0.2	2.43±0.08	-55±2
6.3nm	6.8±0.4	6.3±0.4	5.09±0.07	-60±3