Significant Enhancement in the Performance of Porphyrin-Based Dyes for Dye-Sensitized Solar Cells: Aggregation Control by Chenodeoxycholic Acid

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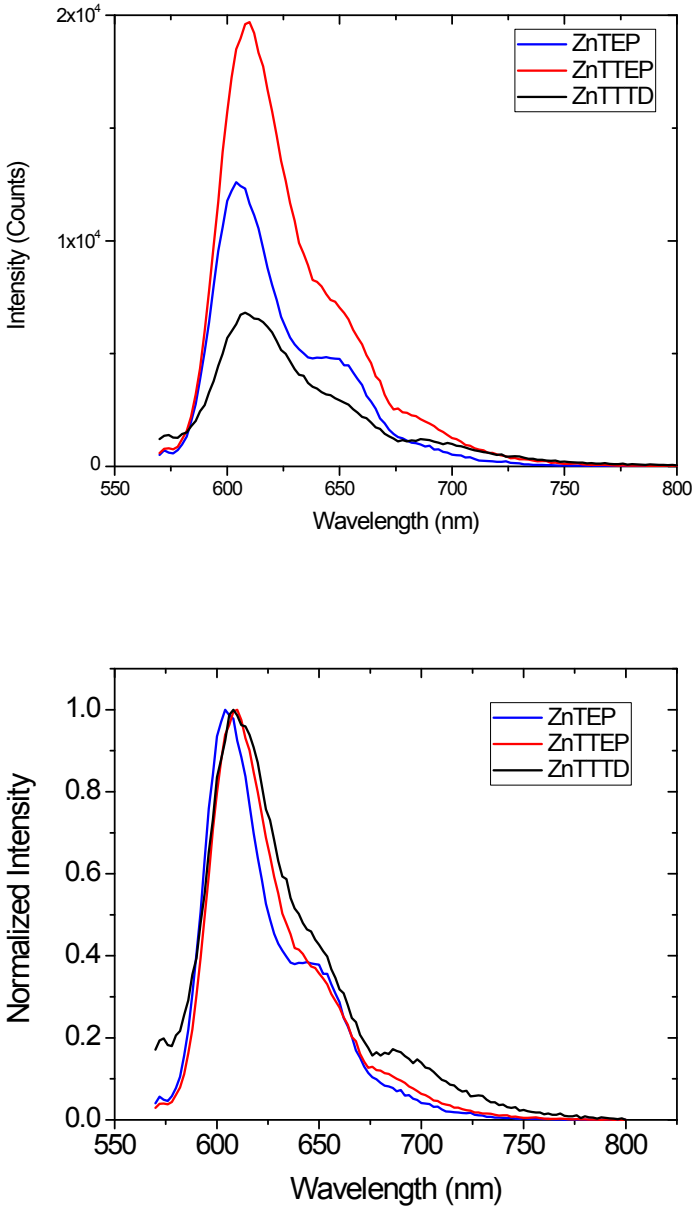
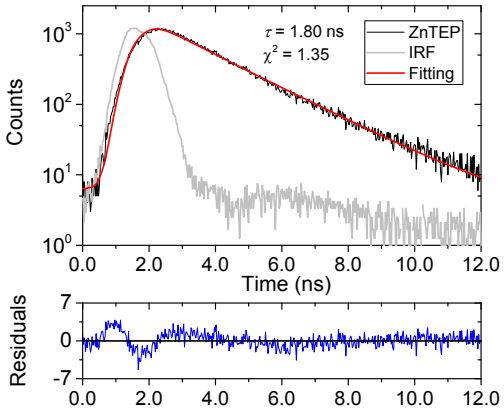


Figure S1 The fluorescence spectra of dyes **ZnTEP**, **ZnTTEP** and **ZnTTTD**.

a)



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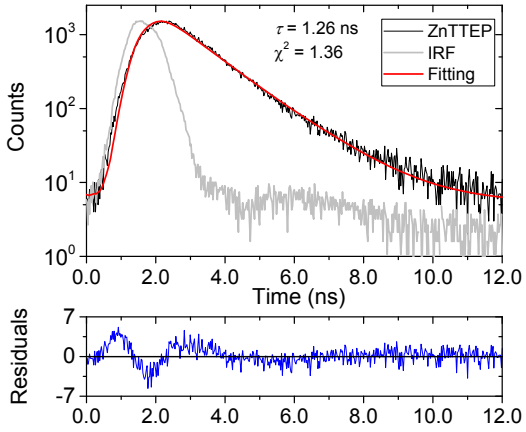

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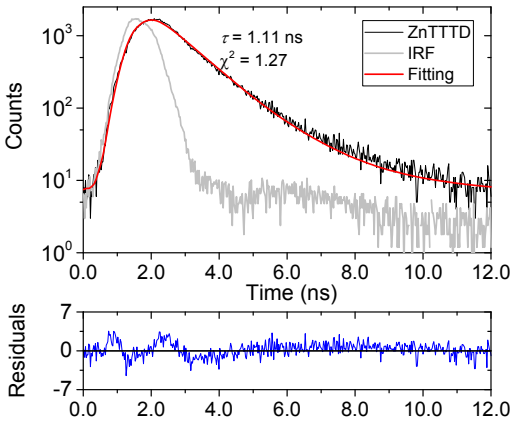

Figure S2 Time resolved photoluminescence decay of a) ZnTEP, b) ZnTTEP and c) ZnTTTD dye solution in dichloromethane,

Photoluminescence and time resolved photoluminescence decay spectra of dye solution in dichloromethane were measured with an Edinburgh Instruments FLS980 spectrometer. The fluorescence lifetime was performed with Time Correlated Single Photon Counting (TCSP) mode using ELP-445 (λ 441.8 nm, linewidth < 4.5 nm, maximum pulsed width@10 MHz ~100 ps) picosecond pulsed laser diode as an excitation source. The lifetime data were extracted from the exponential fitting ($B1\exp(-t/\tau)$) from the transient decay curves.

Table S1 Lifetime data calculated from the transient decay spectra of the dye solution in dichloromethane

Dyes	**τ (ns)**	**B1**	**χ^2**
ZnTEP	1.80	0.035	1.35
ZnTTEP	1.26	0.040	1.36
ZnTTTD	1.11	0.041	1.27